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University of Michigan
Ann Arbor, Michigan

ASSOCIATE EDITOR
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Ann Arbor, Michigan

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Joanne Branson
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Leo F. Godley
William Johnson
Clifton Latiolais
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American Journal of Hospital Pharmacy

American Society of Hospital Pharmacists

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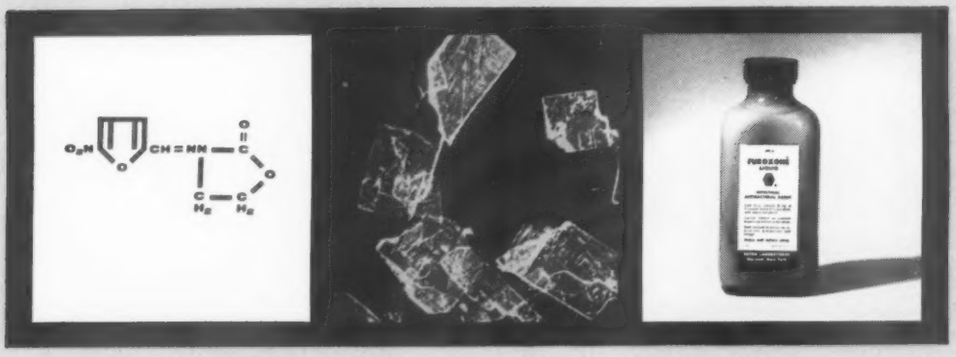

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1. Ponce de Leon, E.: Antibiotic Med. & Clin. Therapy 4:816, 1957.
2. H. W. McFadden and M. M. Musselman: Personal communication to Eaton Laboratories.

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as the president sees it—

ROBERT C. BOGASH, *Lenox Hill Hospital, New York City*

► THIS IS MY FIRST EXPOSURE to this column and I must confess that this effort is in several ways peculiar to me. You might question what is so peculiar about it. Initially, there is the novelty of writing "as the president sees it." There is then the fact that I am writing this several weeks before installation as president and certainly even longer before publication. Peculiar also because this is a spontaneous effort to record a thought pattern which crept into presence while I was actively engaged in an apparently unrelated task. Several moments ago I was busily concentrating on the plans for a pharmacy central sterile supply department in the new Lenox Hill Hospital—yet several years in the offing. A series of thoughts kept nibbling at my central attraction to the job at hand. Finally, I put aside the blue prints, building codes, population surveys, equipment specifications, etc., to reflect on this psychic disturbance. What was this thought? Simply put—that planning the new pharmacy central sterile supply department was similar to this coming presidential year and further, similar to hospital pharmacy generally.

While apparently unrelated, closer observation indicates a strong analogy.

Planning a new pharmacy can best be accomplished with at least the following tools, (1) application of previous experience, (2) consultation, (3) patience, (4) diligence; recognition of both the current and future needs of the community and hospital; lastly, the judgment and conception of how these needs can be professionally and administratively satisfied.

How is this analogous? Let us examine the tools I shall need during this coming year. Although constitutionally acceptable, traditionally we elect for president someone who has not previously occupied that office. Those elected generally have had considerable executive committee experience, but none as president. The necessity for consultation therefore assumes even more importance. The Godleys, Archambaults, Parkers, Bowles, Becks and Franckes (D & G) will give me valuable insight based on their presidential experience. Consultation with the Executive Committee and individual members of the SOCIETY will provide valuable thought and direction. Diligence, a virtue to be coupled with patience. These I can but dedicate myself to.

Recognition of current and future needs is a vitally important point and one that I maintain can best be done when there is a constant two-way communication between the membership, you, flowing through the Affiliated Chapter, to the Executive Committee. This flow pattern is always open—it is available to every member through the House of Delegates. Finally, the judgment of how these needs can be professionally satisfied, while an end function of the Executive Committee, is brought about by the membership through resolutions. The AMERICAN SOCIETY OF HOSPITAL PHARMACISTS is as functional and active as you make it. So it is in hospital pharmacy—departmentally and nationally.

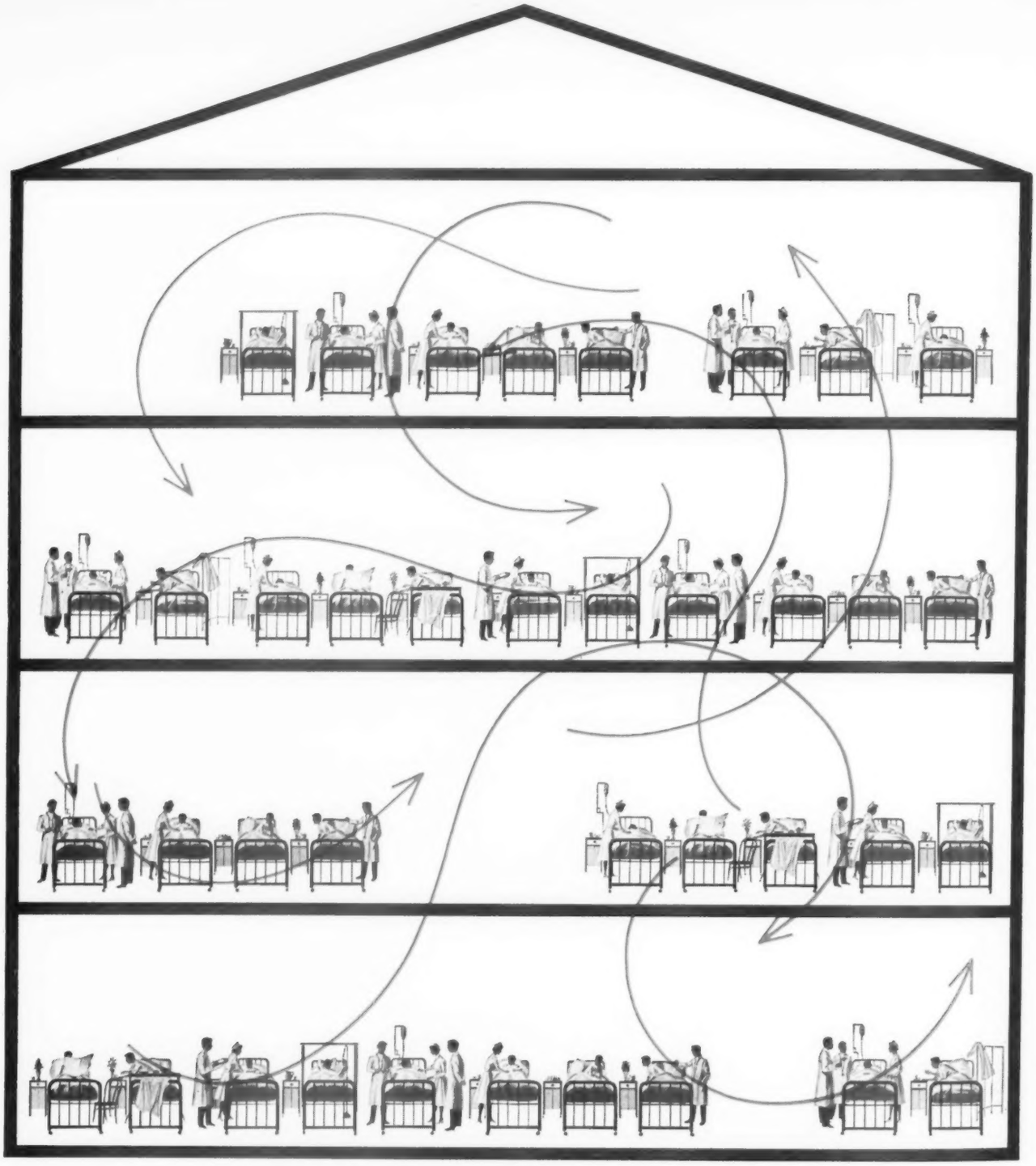
I leave the acceptance of this simile to your judgment.

During this coming year I shall sincerely strive to discharge the direct obligations and responsibilities which you have entrusted to me. As important, however, are the indirect responsibilities, of all SOCIETY Members, who contribute to the growth of our profession.

By virtue of position, I shall be with many of you between now and next April. Only with the knowledge of your needs and desires can I function best. I trust you will use me as a vehicle to relay to the Executive Committee and Membership your thoughts. A constant program of two-way communication can do much to keep us growing internally as well as organizationally. We need both.

It is then with warm regard that I greet you and hope to see you soon during this coming year.

Robert C. Bogash—



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News

F.I.P. Meeting, Brussels 1958

The General Assembly of the Fédération Internationale Pharmaceutique will meet in Brussels, Belgium, September 8 to 15, 1958. This meeting will be held in conjunction with the 18th International Congress of Pharmaceutical Sciences. Of general interest to those who may plan to attend this meeting is the International Exposition which is being held in Belgium during 1958.

The Section of Hospital Pharmacists of the F.I.P. will hold meetings under the presidency of Dr. Jean Cheymol of France. The theme for the meetings will be the legal responsibility of hospital pharmacists with reference to safety practices in dispensing drugs to patients in such a manner as to avoid accidents and medication errors. In addition, other papers, reports, and discussions on topics of current interest to hospital pharmacists will be held. Mr. Herbert Grainger, Chief Pharmacist at Westminster Hospital, London, England, is Secretary of the Section and in charge of program arrangements. Other officers of the Section of Hospital Pharmacists include the Vice Presidents, Dr. H. Lehman of Switzerland and Dr. Don E. Francke of the United States.

Other sections which will meet during the week include the Scientific Section, the Section of Industrial Pharmacists, the Section of Pharmacognocists, the Section of Military Pharmacists, and the Press and Documentation Section. A joint session is being arranged by the Scientific Section and the Press and Documentation Section to discuss a plan for the preparation and distribution of international pharmaceutical abstracts. Results of a comprehensive survey of military pharmacy will be reported to the Section of Military Pharmacists by Colonel William L. Austin, Chief Pharmacy Consultant to the Surgeon General of the Army, in collaboration with a member of the Yugoslav Military Delegation.

Meetings will take place in buildings adjacent to the International Exposition. A series of deluxe motels will be used to house those attending the Congress. Meals may be obtained in nearby restaurants.

The tentative program outline for the Congress is included below. It must be emphasized that this is only a very general skeleton outline and does not contain the list of papers to be presented nor all the topics to be discussed either at the General Assembly or at the meetings of the Sections.

BRUSSELS CONGRESS 1958

Program of the XVIIth General Meeting of the F.I.P. and of the XVIIIth International Congress of Pharmaceutical Sciences

Saturday, September 6, 1958

10:00 A.M.	Opening of the Secretariat Reception of the members Meeting of the Executive Board
2:00 P.M.	Reception of the members Meeting of the Executive Board

Sunday, September 7, 1958

10:00 A.M.	Meeting of the Executive Board
2:30 P.M.	Meeting of the Executive Board

Monday, September 8, 1958

9:00 A.M.	A solemn mass will be celebrated on the initiative of the "Societe SS. Cosme et Damien" (Belgian Association of Catholic Pharmacists)
11:00 A.M.	Academic Session Opening session of the XVIIth General Assembly of F.I.P. and of the XVIIIth International Congress of Pharmaceutical Sciences Presentation of the Host-Madsen Medal
2:30 P.M.	General Assembly of the International Congress of Pharmaceutical Sciences General Conferences

Tuesday, September 9, 1958

9:30 A.M.	Scientific Section Symposium on Radio-isotopes and their Applications Meeting of Sections and Commitees
2:30 P.M.	Meeting of Sections and Committees
5:00 P.M.	Meeting of the Scientific Section
Evening	Party at the Town Hall with Reception by the Burgomaster of Brussels

Wednesday, September 10, 1958

9:30 A.M.	General Assembly of the F.I.P. Congress
2:30 P.M.	Scientific Section: Symposium on Biometry and Its Applications
5:30 P.M.	Joint Meeting of the Scientific Section and the Press and Documentation Section: Discussion on Pharmaceutical Abstracts

Thursday, September 11, 1958

9:30 A.M.	
2:30 P.M.	Meeting of Sections and Committees
5:00 P.M.	Meeting of the Council
Evening	Reception in the Halls of the "Musees Royaux d'Art et Histoire"

Friday, September 12, 1958

Day visit to the International Exhibition.

Saturday, September 13, 1958

9:30 A.M.	General Assembly of the F.I.P. Reports and Discussions 1. Committee on Practicing Pharmacy in Dispensaries 2. Report on the Teaching of Pharmacy
2:30 P.M.	Discussion and approval of the motions and resolutions of the various F.I.P. Sections and Committees Motions and Resolutions

Sunday, Sept. 14 and Monday, Sept. 15, 1958

Excursions to the most attractive regions of Belgium.

* According to circumstances this draft programme might be subject to modification.

A retrospective exhibition about pharmacy will be organized in the students' quarter of Brussels University.

A special program of visits and excursions will be worked out on behalf of the persons who accompany the Congress members.

Members will have the opportunity to visit the International Exhibition and will enjoy many advantages.

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► DR. JOHN W. CRONIN, Assistant Surgeon General and Chief of the Bureau of Medical Services of the U. S. Public Health Service, died of a heart attack March 26. Dr. Cronin was 52 years old. Dr. Cronin, one of the best known officials of the Public Health Service, was actively interested in hospital pharmacy and had participated in several meetings of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. His article "Pharmacy and Hospital Expansion" appeared in the May-June (1953) issue of *The Bulletin of the American Society of Hospital Pharmacists*. Dr. Cronin had supervised the Hill-Burton Hospital Construction Program from 1949 to November 1, 1956 when he was promoted to Assistant Surgeon General.

The *Congressional Record* of March 27th carries a tribute to Dr. Cronin by Senator Lister Hill, co-author of the Hill-Burton Act. Senator Hill said:

Mr. President, regretfully I rise to bring to the attention of the Senate the most unfortunate and premature death of one of our country's finest public servants. I refer to Dr. John W. Cronin, who, as Assistant Surgeon General of the United States Public Health Service and Chief of the Bureau of Medical Services, was suddenly stricken yesterday while at work.

Dr. Cronin was well known and highly esteemed by the Members of the Senate. During the years in which he served as director of the hospital survey and construction program we came to know him particularly well because of his outstanding administration of a program involving many possible difficult relationships between the Federal Government, the States, and local communities. As the administrator of that program, Dr. John Cronin displayed such qualities of wisdom, of tact, and of dedication as resulted in making the program one of the most highly successful and fruitful the Nation has known. Under his wise administration thousands of hospitals and other badly needed health facilities have been built throughout the land. They will serve as constant reminders of the devotion to the public's health of this outstanding American. The Public Health Service and the 170 million people it serves so well will sorely regret his loss.

International Pharmaceutical History

The Second International Meeting of Pharmaceutical History will be held in Venice, Italy from the 7th to 9th of October, 1958. The meeting will be organized by the Italian Association of Pharmaceutical History and will be under the patronage of the Italian Pharmacists' Federation. Those who wish to attend the meeting may obtain further information by writing to Professor Doctor Antonio E. Vitolo, Piazza Carrara, 10, Pisa, Italy.

Liberal Education and American Pharmacy

The Institute of Higher Education of Columbia University Teachers College has recently compiled a bibliography of "Liberal Education and American Pharmacy." This compilation by Kevin P. Bunnell and other members of the Institute's staff was made possible by a grant from the Carnegie Corporation. The bibliography, comprised of 87 references, has been assembled "as a means of studying the development of the ideal of liberal education in the preparation of pharmacists."

A limited number of copies of the bibliography are available free of charge to educators and practitioners who are interested in the problem of liberal education in pharmacy. Requests should be addressed to Dr. Earl J. McGrath, Executive Officer, Institute of Higher Education, Teachers College, Columbia University, New York 27, N. Y.

► MR. ROBERT E. LAWSON has been appointed to the position of Director of Pharmaceutical Services at the University Hospital, University of Maryland, Baltimore. Mr. Lawson is a graduate of the School of Pharmacy of the University of Colorado. He served an internship in hospital pharmacy at Johns Hopkins Hospital and received his Master of Science degree from the School of Pharmacy of the University of Maryland in 1953. During the past year Mr. Lawson has been the assistant chief pharmacist at Springfield City Hospital, Springfield, Ohio.

Hospital Pharmacists Attend Work Simplification Course

Through the combined services and integrated efforts of the Philadelphia Chapter of the Society for Advancement of Management, Jefferson Medical College Hospital, and The Greater Philadelphia Hospital Pharmacists' Association, a program in Hospital Work Simplification has been offered.

The course, in its fourth year, was held on Wednesday evenings in the offices of Jefferson Medical College Hospital Pharmacy. It was concluded April 16, 1958, with presentation of certificates to the participants.

The course was under the direction of Mr. Olie Bell, Industrial Engineer, J. W. Landenberger and Company, a member of SAM's Philadelphia Chapter.

Participating in the course were: Sister M. Gentilla, Director of Pharmacy Service, Nazareth Hospital, Philadelphia, Pa., Mr. Alonzo Sudler, Director of Pharmacy Service, Abington Memorial Hospital, Abington, Pa., Mr. Robert Dopko, Manufacturing Pharmacist, Jefferson Medical College Hospital, Mr. Frank Fus, Control Pharmacist, Jefferson Medical College Hospital, Mr. Howard Hoffman, Resident Administrator (Northwestern University) at the Philadelphia Veteran's Administration Hospital, and Mr. Fred Salfi, Mr. Charles King, Jr., Mr. Allen Lister, and Mr. Herb Carlin, Pharmacy Residents at the Jefferson Medical College Hospital.

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News

► BURTON E. BECK has been elected Vice-President of Industrial Relations for Eli Lilly and Company. He has been executive director of personnel and public relations at Lilly for the last six years.

A native of Indianapolis and a 1935 graduate of Park School, Beck joined Lilly in 1939 following his graduation from Cornell University with a Bachelor of Arts degree in psychology. Since then he has been chief of placement training and supervisory studies, chief of incentives and job evaluation, assistant manager of methods and standards, staff assistant to the vice-president of production, and chairman of the organization planning staff.

Rutgers Conference

Legislation, public and trade relations, retail trends, education, and ethics and advertising problems facing pharmacy will be examined at the seventh annual Rutgers Pharmaceutical Conference at the New Jersey State University in New Brunswick, May 14.

Max A. McDaniel, Vice-President, Pharmaco, Inc., Kenilworth, N. J., is the general chairman of the Conference. Sessions will be opened at 10 A.M. at Rutgers gymnasium by Raphael M. Nacca, Executive Vice-President, Organon, Inc., Orange, N. J., morning chairman, following a welcome by Dr. Lewis Webster Jones, University president.

Dr. Karl Bambach, Executive Vice-President, American Drug Manufacturers' Association, New York, will detail legislative problems in a talk titled "The Washington Scene and the Drug Industry."

"Survival Is For Men Only," Edmund F. Beckwith, Jr., President, Crookes-Barnes Laboratories, Inc., Mountain View, N. J. will assert in discussing public and trade relations. Benjamin Schultz of Deal, N. J., President New Jersey Pharmaceutical Association will ask "Where To From Here?", speaking on retail pharmacy trends. University of Wisconsin College of Pharmacy Associate Dean Louis W. Busse is slated to examine "Pharmacy Internship—A Post Graduate Program."

Miss Dorothy Noyes, Vice-President, Noyes and Sproul, Inc., New York advertising and public relations firm, will conclude the morning program by telling conferees "What Doctors Say They Want From You," a detailing of ethics and advertising.

Following luncheon greetings by Mr. McDaniel and Dr. Roy A. Bowers, Dean of Rutgers College of Pharmacy, Dr. Salomon J. Flink, Professor of Economics at Rutgers School of Business Administration, who is consultant to New Jersey General Assembly committees will view "New Jersey's Future—Prospects and Problems."

William T. English, Eastern Regional Sales Manager, Becton Dickinson & Co., Rutherford, N. J., will moderate a question period for morning session speakers beginning at 2:45 P.M. General Chairman McDaniel will make a brief summation and close the Conference at 4 P.M.

Sponsored by Rutgers College of Pharmacy Extension Service and Extension Division, the Conference is planned by a 120-member committee composed of representatives of all phases of pharmacy, government, education and journalism.

Mrs. Evelyn Carlin of Paterson, N. J., Past-President of the New Jersey Society of Hospital Pharmacists, is Conference Vice-Chairman. Dr. John L. Voigt, Rutgers Pharmaceutical Extension Service Director, is conference secretary.

Philadelphia College To Offer Special Summer Courses

During the summer of 1958, four special courses will be available at the Philadelphia College of Pharmacy and Science. One course, on the preparation of parenteral products, will be available for pharmacists through the cooperation of the Philadelphia Hospital Pharmacists' Association. Three other courses dealing with radioisotopes will comprise the Fifth Annual Radiochemical Institute to be offered by the College.

The parenteral products course will be conducted by Dr. Kenneth E. Avis, of the College faculty, from July 7 through July 18. This course is open to all persons with previous training and experience in pharmacy, either in hospital work or otherwise. Enrollment in this course is limited.

The radiochemical courses, under the direction of Dr. Arthur Osol and Dr. Grafton D. Chase of the College, will be given by fifteen faculty members and guest lecturers. From July 7 through 18, there will be a two-week introductory course for individuals with a basic science background but no previous experience with radioisotopes. From July 21 through 25, there will be a one-week advanced course for individuals with a background of course 1 or its equivalent, and this will deal with the biological and medical applications of radioisotopes. From July 28 through August 1 there will be another advanced course of one week's duration dealing with radiochemical instrumentation. Enrollment in each of these three courses is limited to thirty participants.

Further details and application forms may be obtained from the Registrar of the Philadelphia College of Pharmacy and Science, 43rd Street, Kingsessing and Woodland Avenues, Philadelphia 4, Pennsylvania.

Bristol Labs Joins NPC

Bristol Laboratories, Inc. has became the 22nd drug manufacturer to join the National Pharmaceutical Council, it was announced by Carl K. Raiser, President.

Dr. Philip I. Bowman, President of Bristol Laboratories will represent his company on the Council's Board of Directors. Formed in 1954, the NPC has as its major aim the development of the highest standards of ethics and integrity in the drug industry in order to promote the interests of the public, physicians and all levels of pharmacy.

Other NPC members are: Abbott Laboratories, American Home Products Corp., Ames Company, Inc., Burroughs Wellcome & Co. (USA) Inc., Ciba Pharmaceutical Products, Inc., Geigy Pharmaceuticals (Division of Geigy Chemical Corp.), Hoffmann-La Roche, Inc., Lederle Laboratories (Division of American Cyanamid Co.), McNeil Laboratories, Inc., Mead Johnson & Company, Merck Sharp & Dohme (Division of Merck & Co., Inc.), The Wm. S. Merrell Company, Ortho Pharmaceutical Corp., Pitman-Moore Company (Division of Allied Laboratories, Inc.), Chas. Pfizer & Co., Inc. (J. B. Roerig & Co. Division), G. D. Searle & Co., Smith Kline & French Laboratories, E. R. Squibb & Sons (Division of Olin Mathieson Chemical Corp.), The Upjohn Company, Warner-Chilcott Laboratories, Winthrop Laboratories (Division of Sterling Drug, Inc.).

► JOHN N. HATFIELD, Director of Passavant Memorial Hospital in Chicago, has been selected to receive the 1958 Distinguished Service Award of the American Hospital Association. The award, highest honor conferred by the Association, is given for outstanding leadership in hospital administration. Tol Terrell, President of the Association, will present the award to Mr. Hatfield on August 20 at the Association's annual convention in Chicago.

► DR. GEORGE RIEVESCHL, JR., discoverer of Benadryl, North America's first antihistamine for treating hay fever and other allergies, has been elected to the Board of Directors of Parke, Davis & Company, Ltd. His election as a Director of the Canadian pharmaceutical firm was announced by C. D. Smith, Vice President and Managing Director of Parke, Davis & Company, Ltd.

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Calcium	5 mEq.		
Magnesium	3 mEq.		

*Obtained from metabolic conversion of lactate and acetate ions.

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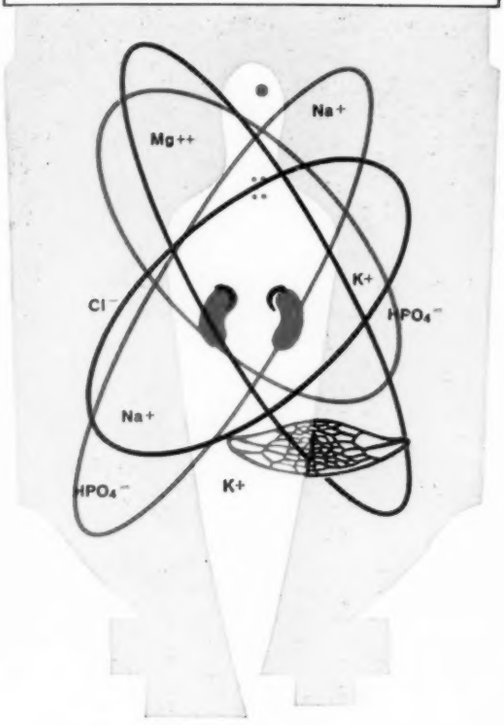

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Georgia Society

Members of the Georgia Society of Hospital Pharmacists met in Augusta for the October meeting. At this time the Minimum Standards for Pharmacies in Hospitals was reviewed and a report was heard on the poison control centers in Georgia.

New officers for 1958-59 elected included *President,* Mrs. Clara Ross Greene, University Hospital, Augusta; *Vice-President,* Mr. Charles Merrett, J. D. Archibald Memorial Hospital, Thomasville; *Treasurer,* Mr. W. S. Havron, Tri County Hospital, Ft. Oglethorpe; and *Secretary,* Miss Rheta E. Leverett, University Hospital, Augusta.

Louisiana Society of Hospital Pharmacists

The Louisiana Society of Hospital Pharmacists held its annual meeting in Baton Rouge on Friday, March 21. The program was integrated with the Convention of the Louisiana Hospital Association, of which the Society is an affiliate.

The program began with the President's reception on Thursday evening, March 20, a gala affair which everyone thoroughly enjoyed. On Friday, March 21, the day began with a panel discussion on "My Responsibility for Good Patient Care" which was moderated by Dr. Albert Snoke of the American Hospital Association and included Sister Mary Lucille, Pharmacist-Purchasing agent at St. Patrick's Hospital, Lake Charles, La. Sister Lucille said that the Pharmacist-Purchasing agent position was a happy combination, resulting in greater coordination and ultimately contributing to better patient care.

ASHP President Leo Godley came from Kalamazoo, Michigan to address the Society on "What the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS Means to the Louisiana Society of Hospital Pharmacists." In the afternoon, Dr. E. J. Ireland of Loyola University delivered a thought-provoking talk about "The Status of Pharmacy Today" in which he warned against complacency and present day pharmacy's proclivity to rest on its laurels. He was emphatic in stating that our imperative duty demands that we seek only the very best to fill pharmacy's ranks.

The program ended with an interesting panel discussion on "Pharmacy Administration," moderated by Mr. Albert Lauve. Local Chapter President Joseph Crisalli, Vice-President Troy Carter, Treasurer Herbert Mang and Southeastern Vice-President Malcolm Clause were panelists. Each dealt with an area of pharmacy administration. President Leo Godley actively participated in the program throughout, sometimes answering questions and sometimes leading the discussion. The group enjoyed the program which was at once both informal and informative.

Akron Area Society

Twenty-one members were present for the March 4 meeting of the Akron Area Society of Hospital Pharmacists which was held at Cuyahoga Falls Green Cross Hospital. In the absence of the President, the meeting was presided over by Vice-President Mr. McGowan.

The Akron Area Society submitted the following projects to the Chairman of the National Committee on Special Projects: the Student Visitation Project; the Disaster Supply Program; and the High School Student Recruitment Program.

During the business session Mrs. Jeanne Sickafoose, Canton Aultman Hospital, Canton was named the delegate from the Akron Area Society to the ASHP Annual Meeting in Los Angeles. Other business covered included plans for the annual banquet, a proposed amendment to the constitution, and a proposed study for revision of the Minimum Standard for Pharmacies in Hospitals.

Following the business session, Mr. Leon Bailey, Youngstown Southside Hospital, introduced the speaker, Dr. O. A. Turner, Neurosurgeon at Youngstown Southside Hospital. Dr. Turner spoke on "Recent Advances in Diagnosis of Nervous System Disorders."

Western Pennsylvania Society

"Establishment of a Poison Control Center in the Hospital Pharmacy" was the topic of the March 26 meeting of the Western Pennsylvania Society of Hospital Pharmacists held at Homestead Hospital.

Mr. Robert Cathcart, Chief Pharmacist at the Delaware Hospital, Wilmington, Delaware was the guest speaker and he highlighted his talk by presenting each of the members with a printed set of information and references needed for the establishment of a Poison Control bureau. Mr. Cathcart recommended the use of a card file system in which each card lists the preparation, its toxic ingredients, degree of toxicity, signs and symptoms of poisoning, treatment, and additional references to consult. Among the statistics which he cited was the fact that one-third of all the accidental poisonings which occur are in children under five years of age. Most of the calls received at the Delaware center are between the hours of one and five in the afternoon during week days. He stated that there are approximately thirty-six toxic preparations in the average home. This is certainly good reason why a poison control center is needed in every city.

The group was pleased to have Dr. Edward C. Reif, retiring Dean of the University of Pittsburgh School of Pharmacy present at this meeting. Dr. Reif is head of the Department of Pharmacology and Toxicology, and consultant Pharmacologist at St. John's Hospital, Pittsburgh.

The Society is also engaged in completing another Special Project which is the collection of drug samples for Dr. Thomas A. Dooley, who is in the United States to secure aid and supplies for his hospitals in Vietnam.

The schedule for future meetings of the Western Pennsylvania Society is as follows:

Wednesday, June 4 - Mercy Hospital - Business

Wednesday, June 18 - North Park Hospital - Picnic

Wednesday Evening, September 22 - St. John's Hospital - Pre-Seminar Business Meeting

Wednesday, October 15 - Carlton House Hotel - Seminar

Wednesday Evening, November 19 - West Penn Hospital - Pennsylvania State Laws

Wednesday Afternoon, December 10 - to be announced - Christmas Party

Michigan Society

The Michigan Society of Hospital Pharmacists met at Sinai Hospital in Detroit on April 10. The principal speaker was Mr. John Zugich, Assistant Director, University Hospital, Ann Arbor. Mr. Zugich is also a past president of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. He spoke on "Accreditation of Hospitals," with emphasis on the Pharmacy Department.

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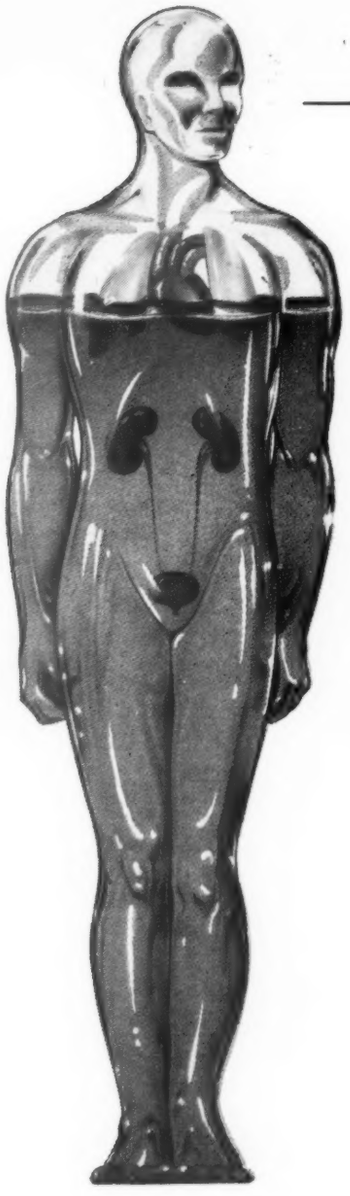

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REFERENCES: Baer, J. E. *et al.*: Fed. Proc. **16**:278 (March) 1957; Beyer, K. H. *et al.*: Fed. Proc. **16**:282 (March) 1957; Ford, R. V. *et al.*: M. Rec. & Ann. **51**:376 (April) 1957; Ford, R. V. *et al.*: Arch. Int. Med. **100**:582 (Oct.) 1957; Ford, R. V. *et al.*: Antibiotic Med. & Clin. Therapy (in press); Moyer, J. H. *et al.*: Proc. Soc. Exper. Biol. & Med. (in press); Novello, F. C. and Sprague, J. M.: J. Am. Chem. Soc. **79**:2028 (April 20) 1957; Russo, H. F. *et al.*: Fed. Proc. **16**:333 (March) 1957.

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REFERENCES: Hollander, W. and Wilkins, R. W.: Boston Med. Quart. **8**:69 (Sept.) 1957; Freis, E. D. *et al.*: J.A.M.A. (in press); Finnerty, F. A.: N. Y. State J. Med. **57**:2957 (Sept. 15) 1957; Freis, E. D. and Wilson, I. M.: Med. Ann. District of Columbia **26**:468 (Sept.) 1957; Freis, E. D. *et al.*: Circulation (in press).

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Dade County Society

Members of the Dade County Society of Hospital Pharmacists met on Tuesday, March 11, at the Upjohn Depot in North Miami, Fla. During the business session, the President appointed Miss Eleann Moran of Mt. Sinai Hospital, as Chairman of the local Committee on Special Projects. This year, the group will study one phase of the Minimum Standard for Pharmacies in Hospitals. Plans were also made for the annual Spring banquet. Following the meeting, members of the group enjoyed a tour of the Upjohn Warehouse and a film on hydrocortisone.

Massachusetts Society

Members of the Massachusetts Society of Hospital Pharmacists met at the Statler Hotel in Boston on March 26. The business session included reports covering professional liability insurance for hospital pharmacists, participation in the New England Hospital Assembly, and receipt of a check for $100 to begin a scholarship and award fund. This fund will be developed in order to provide scholarships at any New England College where pharmacy is taught.

New officers of the Massachusetts Society elected for the coming year include *President,* William Grady; *Vice-President,* John Webb; and *Secretary-Treasurer,* James Durkee. Mrs. Ethel Pierce was named the delegate to the ASHP Annual Meeting in Los Angeles.

Following the meeting, the group was entertained at a dinner sponsored by the Ciba Pharmaceutical Company with Mr. Paul Parker, Director of the Division of Hospital Pharmacy of the A.Ph.A. and the ASHP, as guest speaker.

Southern California Chapter

Dr. B. F. Klauzmann, Assistant Clinical Professor of Medicine at the University of California, Los Angeles, was the principal speaker for the March 12 meeting of the Southern California Chapter of the ASHP held at the offices of The Upjohn Company in Los Angeles. Sixty-five members and guests were in attendance. Dr. Klauzmann spoke on "What's New in the Treatment of Allergic Diseases?", and his discussion was supplemented with slides.

Also included on the program was a detailed report on the new drug, "Fungizone," which has been recently released by E. R. Squibb and Son. This was presented by Dr. Masoyoski Matsumo of White Memorial Hospital. Also, Mr. Jack Heard, Chief Pharmacist at the University of California Hospital, Los Angeles, presented a brief report on "Golden Era on Dispensing," taken from a recent pharmaceutical publication. The last two items were a new innovation to the meetings of the Southern California Chapter. According to the plan, each month a member will give a report on a new drug and another on an interesting article of his choice taken from one of the current journals.

During the business session, reports were heard on plans for the Los Angeles Convention and appointments were made to work on the revision of Minimum Standard for Pharmacies in Hospitals in accordance with the work of the National Committee on Minimum Standards and Special Projects. President Joseph Beckerman was elected delegate to the 1958 ASHP Annual Meeting and Miss Lillie Wiel was named alternate.

Michigan Society

Members of the Michigan Society of Hospital Pharmacists met at the Veteran's Memorial Building in Detroit on March 20. The guest speaker for the evening was Mr. C. E. Kuhlman, Customer Promotion Services, Eli Lilly and Company. He spoke on "Justifying Cost of Medical Care." In his presentation, Mr. Kuhlman emphasized the role that might be played by hospital pharmacists in informing nurses and other hospital personnel regarding cost of drugs. During the business session, nominations were made for the 1958-1959 election of officers. Also dues in the local group were increased from three to five dollars. This was handled through a vote of those attending the meeting and requires a change in the Society's By-Laws.

Philadelphia Hospital Association

The official name of the hospital pharmacists organization in Philadelphia has been changed to "The Greater Philadelphia Hospital Pharmacists' Association." This group was formerly known as the "Philadelphia Hospital Pharmacists' Association."

As part of the Twentieth Anniversary Year program of the Greater Philadelphia Hospital Pharmacists' Association, Mr. John Culkin, Our Lady of Lourdes Hospital, Camden, N. J., Program Chairman, arranged with Ciba Pharmaceutical Products, Inc. for a tour of the company facilities. Arrangements and transportation were made with Mr. Ken M. Webb, District Manager, and Mr. James G. Smith, Ciba hospital representative in the Philadelphia area, to motor to Summit, New Jersey.

The group of hospital pharmacists was welcomed at Ciba by Peter Christensen of Public Relations and were guided to the company cafeteria for lunch.

The tour began at the Chemistry Laboratories where tests were observed on time-disintegration tablets. Seen among the expanding facilities was a new Vivarium which utilized modern methods for caring and breeding control study animals. The storage area, manufacturing facilities, and production methods were observed and were very interesting and informative.

The highlight of the day was a tour through the new Pharmaceutical Research and Development Laboratories, again showing the latest methods and increasing scope of this important function to a pharmaceutical company.

The tour was enthusiastically received by the hospital representation and commendations were in order to Mr. Peter Christensen for an informative and well planned itinerary.

In attendance were the following members of the Philadelphia group: Rudolph DeCerchio, Our Lady of Lourdes Hospital, Camden, N. J.; Frank Fus, Jefferson Medical College Hospital, Philadelphia; Abraham Herman, Landis State Hospital, Philadelphia; Ben Klein, Albert Einstein Medical Center, Northern Division, Philadelphia; Harry Kuff, Philadelphia General Hospital, Philadelphia; Albert Micelli, Cooper Hospital, Camden, N. J.; William Haller, Veterans Administration Regional Office, Philadelphia; and Alan Rosenberg, Eastern Pennsylvania Psychiatric Institute, Philadelphia.

Northeastern New York Society

The March meeting of the Northeastern New York Society of Hospital Pharmacists was held on Wednesday, March 19, 1958 at St. Peter's Hospital, Albany. There were sixteen members present. The following new members were admitted into the Chapter: George M. Ginsberg, Stanley Hagues, Anthony Santulli and M. Nancy Welch. Correspondence was received from the Western New York Chapter inviting us to the Hospital Pharmacy Seminar March 29. Louis P. Jeffrey and Fay Peck, Jr. were designated to attend and represent our Chapter.

A discussion followed concerning the newly conceived Council of Hospital Pharmacists of the State of New York. President Jeffrey would appoint two delegates to the Council. The Nominating Committee for 1958 was Lucy Manvel, Chairman, Virginia McBride, Jane McCollough Prentice and Benjamin Teplitsky. Joyce A. Nautel was named the official delegate to the Annual Meeting of the ASHP in Los Angeles. Miss Josephine A. Stancampiano was named the alternate delegate.

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(1) Hagedorn, A. B.: Proc. Staff Meet. Mayo Clin. **32**:705 (Dec. 11) 1957.
(2) Best, W. R.; Louis, J., and Limarzi, L. R.: M. Clin. North America (Jan.) 1958, p. 3.

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(Editor's note: In fact, staph infection can pave the way for strep infection, too. If strep gets into a wound with antibiotic-resistant staph ... parenteral penicillin won't stop or prevent strep infection even when the strep organisms are penicillin sensitive.)

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AN INCREASED TREND toward the acceptance and use of disposable syringe medication is evident in hospitals throughout the country. Many "standard" hospital parenteral products are now being offered in this relatively new dosage form by pharmaceutical firms. Consideration of some of the advantages of disposable items helps to account for this increasing demand.

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Since some manufacturers (*e.g.*, Organon) supply a completely sterile disposable needle and syringe with the cartridge of medication, the danger of inducing infectious hepatitis or pyrogenic responses in patients is greatly reduced. In addition, the disposable units may also reduce the incidence of serum sickness and anaphylactoid reactions in hospital personnel. Protection is afforded the person preparing the injection, since no withdrawal of a needle from a vial is necessary. Thus there is little risk of puncturing or scarifying his skin.

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The time consumed by nurses and pharmacists in preparing injections is greatly reduced through use of disposable units, since these are always ready for immediate use. This allows nurses to spend more time in actual patient care. In addition, since the disposable unit is completely used up after each injection, the patient need not be charged for a full multiple-dose vial nor need the hospital pharmacy assume the loss for a partially used vial.

No Waste

Precision dosages are assured in the disposable units. This decreases waste of medicament, facilitates inventory control, and increases the efficiency of the hospital pharmacy. In addition, central supply operating costs are reduced through fewer syringe breakages, and reduced need for washing, assembling, sterilizing and storing hypodermic equipment.

Better Patient Psychology

Patient comfort and well-being are increased when the patient becomes aware that the needles are used only once and discarded. In addition, each needle is new, burr-free, and sharp, minimizing the pain on injection.

Economy

Some manufacturers (*e.g.*, Organon) price their disposable units so that the hospital pays only the cost of the medication itself plus the manufacturer's cost for the disposable needle and syringe. This helps make medication administered in disposable units economical, and, when the other advantages of disposable units are considered, a real advance over the use of standard hypodermic equipment with multiple-dose vials.

In line with the trend toward increased hospital usage of disposable syringe medication, Organon Inc. of Orange, New Jersey, a pharmaceutical firm with more than two decades' experience in the manufacture and marketing of quality parenteral products, recently introduced three of its hospital products in disposable unit form. These products are Cortrophin®-Zinc, Liquaemin® Sodium, and Adrestat® (F). Each of these products is available in a package containing a 1-cc cartridge of medication and a sterile B-D®* Disposable Syringe. The packaging of this Organon disposable unit is unique in that the needle and syringe are packaged in a sterile plastic bag, assuring sterility to the moment of use.

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Further information on these three products as well as extra copies of this article for use in presenting the advantages of disposable syringe medication to Formulary or Therapeutics Committees may be obtained by writing to Hospital Sales Department, Organon Inc., Orange, N. J.

References: Bogash, R. C. and R. Pisanelli, *Hosp. Mgt.*, *80*:82 (Nov.-Dec.) 1955. Hunter, J. A., *et al.*, *Hosp. Mgt.*, (Mar., Apr., May) 1956. Skolaut, M. W., and W. H. Briner, *Bull. Amer. Soc. Hosp. Pharm.*, *14*:675 (Nov.-Dec.) 1957. Tinker, R. B., *Bull. Amer. Soc. Hosp. Pharm.*, *13*:319 (Jul.-Aug.) 1956. (These references indicate sources of factual material and do not imply use of the preparations described herein.)

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1. Bryant, H. H.: to be published.
2. Majewski, J. T. and Jennings, T.: Obstetrics & Gynecology, Vol. 5, No. 5, 1955.
3. Majewski, J. T. and Jennings, T.: Obstetrics & Gynecology, Vol. 9, No. 3, 1957.
4. Hardy, E. D.: to be published.
5. Jones, G. S. and Smith, F.: Am. J. Obstet. Gynecol., Vol. 67, No. 3, 628-633, 1954.
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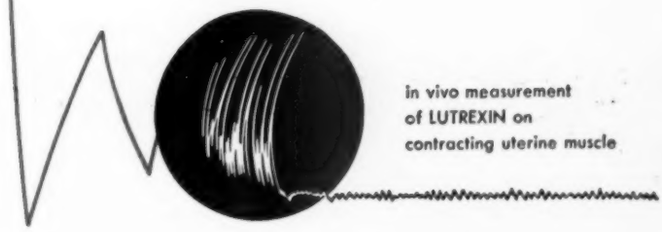

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References: 1. Hull, E.: Kansas City M.J. 33:19 (March) 1957. 2. Grater, W. C.: Ann. Allergy 13:191 (March-April) 1955. *Trademark, Reg. U. S. Pat. Off.

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Time-motion study[1] proves TUBEX saves 39% of nursing injection time!

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1. Hunter, J.A., et al.: Hospital Management *83*:86 (March) 1957.

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When surgery, fever and other debilitating conditions increase the patient's requirements for B complex plus C, Berocca-C provides a balanced comprehensive formula in a stable injectable form READY FOR IMMEDIATE USE.

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Supplied: Berocca-C, 2-cc ampuls, 20-cc vials.
Berocca-C 500, duplex ampul packages, boxes of 50.

Each 2-cc ampul of Berocca-C contains thiamine HCl 10 mg, riboflavin 10 mg, niacinamide 80 mg, pyridoxine HCl 20 mg, d-panthenol 20 mg, d-biotin 0.2 mg and ascorbic acid 100 mg. When higher amounts of vitamin C are desired, use the Berocca-C 500 duplex package containing a 2-cc ampul of Berocca-C plus an additional 2-cc ampul of vitamin C injectable 400 mg.

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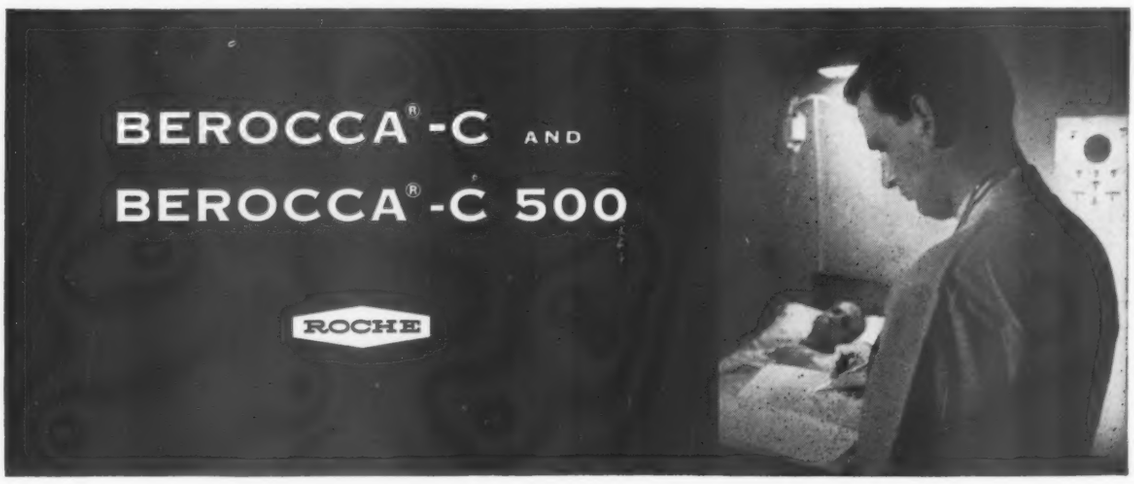


Dear Sirs:

Correction, Needs for Hospital Pharmacists

DEAR SIRS: I must call your attention to two errors which appeared in the published version of my article "Needs for Hospital Pharmacists in the United States 1957 Through 1970." Neither of these errors appeared in the manuscript I submitted to you and I would appreciate it if you would call the following corrections to the attention of your readers.

The heading of the fourth column of the table at the bottom of page 131 is "Pharmacists." This heading should have been "Pharmacies." The corrected table would then appear as follows:

YEAR*	HOSPITALS	BEDS	PHARMACIES	PHARMACISTS FULL & PART-TIME	
1956	6,966	1,607,672	3,773	4,713	959
1955	6,956	1,604,408	3,720	4,437	915
1954	6,970	1,577,961	3,498	4,157	786
1953	6,978	1,580,654	3,245	3,551	not rep.
1952	6,903	1,561,809	3,245	not rep.	not rep.
1951	6,832	1,521,959	3,117	not rep.	not rep.

* Source. Administrator's Guide Issues, Journal of American Hospital Association. 1952 through 1957.

The second correction is in Table 4, page 135. Here the second column is entitled "Projected number of beds in the 2,837 hospitals based on 30,000 beds added annually." In my manuscript, this column was headed "Projected number of beds in the hospitals *employing pharmacists* based on 30,000 beds added annually." As the table was printed it conveys the meaning that the 30,000 annual bed growth of the country is in the 2,837 hospitals. This is not true. The growth is for the nation as a whole.

With the exception of the two points mentioned, I was pleased with the appearance of the article. In fact, I have been more than pleased with the way my papers have been handled and especially with the layout, art work, and numerous other details that make a journal outstanding.

GEORGE F. ARCHAMBAULT, *Pharmacist Director*

Chief, Pharmacy Branch
Division of Hospitals
U. S. Public Health Service
Washington 25, D. C.

Abstracts

DEAR SIRS: With reference to your announcement in the September-October issue (1957), page 603, I take the liberty of offering you my services as a regular contributor to the column "Selected Pharmaceutical Abstracts." I am able to abstract for the JOURNAL pharmaceutical articles written in Czech, Russian and Polish and translate them into English.

HUBERT ZACEK, *Assistant Professor*

Institute of Galenical Pharmacy
State University of Brno
Brno, Trida Obrancu miru 10
Czechoslovakia

Appreciation

DEAR SIRS: . . . I want to take this opportunity to express my appreciation for the professional changes made in the format and title of our publication. These advances mean very much to hospital pharmacy.

SISTER M. CHERUBIM, *O.S.F.*

St. Joseph's Hospital
Joliet, Illinois

DEAR SIRS: The Texas Society of Hospital Pharmacists at its annual meeting in Austin, February 15th and 16th, passed the following resolution:

"Whereas the official publication of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS is now issued on a monthly basis in attractive new format and whereas the name change to AMERICAN JOURNAL OF HOSPITAL PHARMACY reflects prestige in the editorial achievements of the ASHP, be it therefore

"Resolved that the Texas Society of Hospital Pharmacists extend to the Officers and Executive Committee of the ASHP and the editorial staff of the JOURNAL its thanks and appreciation for this invaluable publication in our special field."

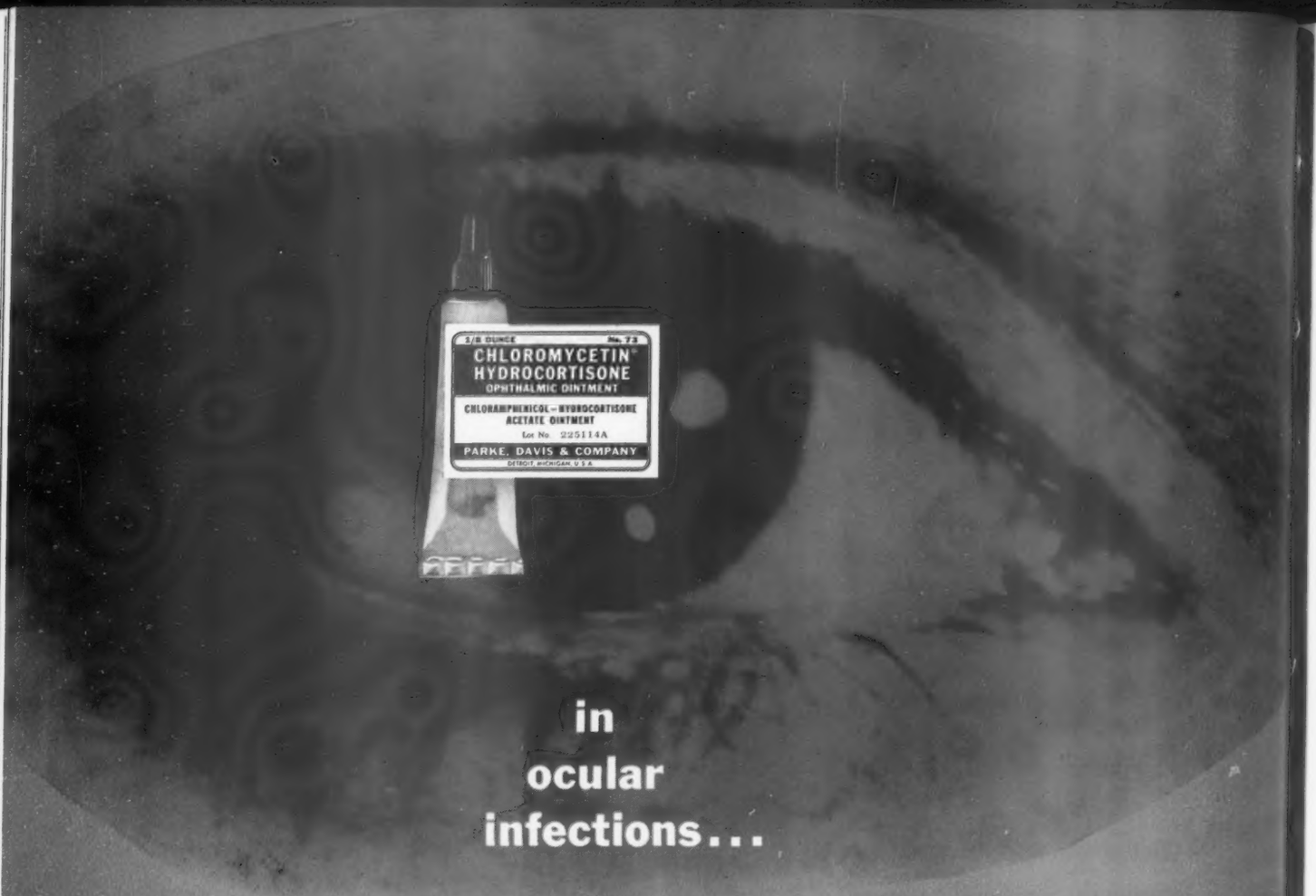
SUSAN CAMPBELL, *Secretary*

Texas Society of Hospital Pharmacists
Beaumont, Texas

DEAR SIRS: Thank you for the publication of the photograph of our exhibit at the Altamount Fair.

LOUIS P. JEFFREY, *Pharmacist-in-Chief*

Albany Hospital
Albany 8, New York



in ocular infections...

combats pathogens—helps prevent scarring

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ophthalmic ointment

Eye infections usually respond well to CHLOROMYCETIN-Hydrocortisone Ophthalmic Ointment.

combats pathogens

CHLOROMYCETIN® (chloramphenicol, Parke-Davis) is notably effective against staphylococci, hemolytic streptococci and other microorganisms frequently encountered in ocular infections.

helps prevent scarring

With hydrocortisone, fibroblastic proliferation of tissue is suppressed, decreasing the likelihood of severe tissue scarring.

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For topical use in ocular infections caused by CHLOROMYCETIN-sensitive organisms.

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Local application at one to four hour intervals, as required.

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Each gram of ointment contains 10 mg. of CHLOROMYCETIN and 5 mg. of Hydrocortisone Acetate in a special petrolatum ointment base. Available in ⅛-ounce collapsible tubes.

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by DON E. FRANCKE

Joint Committee ASHP and A.H.A.

► ONE OF THE FORMAL RELATIONSHIPS between the SOCIETY and other organizations takes the form of a joint committee. Thus, since 1953, the ASHP and the American Hospital Association have had such a committee made up of representatives of the two groups which meets twice annually. The Joint Committee of the A.H.A. and the ASHP operates under formally agreed upon administrative regulations. These provide that each organization shall have four appointed representatives. In addition, the president of each organization is an *ex officio* member of the Committee, and representatives of each staff may attend and participate in meetings. However, only the appointed members of the Committee have the power to vote. Within the past year, Mr. Paul Parker has been made an *ex officio* member of the Committee representing the Division of Hospital Pharmacy.

In practice, the Joint Committee has replaced the Committee on Pharmacy of the American Hospital Association. The latter was for years an active committee and is, perhaps, best remembered for its outstanding *Report on Hospital Pharmacy* issued in 1937.

The Joint Committee functions as a service agency for the two parent organizations. It brings together administrators to discuss problems of mutual interest. It affords opportunity for pharmacists to become better acquainted with some of the administrators' problems within the hospital and serves to acquaint administrators with the plans and objectives of the ASHP for better pharmacy service in hospitals. Fundamentally, the prime objective of the Joint Committee is to improve the care of patients in hospitals through better pharmacy service. The latter is broadly interpreted to include any item related to or involving the use of drugs wherein the specialized knowledge of the pharmacist can or should be utilized.

Actions of the Joint Committee are advisory to, but not mandatory upon, the parent organizations. The Joint Committee may originate actions for consideration by, or it may receive actions for consideration from, the parent organization. For the ASHP, the Executive Committee may approve or disapprove the recommendations of the Joint Committee, this action being subject to review by the membership. For the American Hospital Association the procedure involves, in order, approval by the Council on Professional Practice, the Coordinating Committee, and the Board of Trustees.

The work of the Joint Committee regarding the use of investigational drugs in hospitals is an example of its activity and procedures. This topic appeared on the agendas of the Joint Committee several times; a subcommittee was appointed to draft a tentative policy statement; the suggested statement was discussed, evaluated and revised. When in final form it was sent to the Council on Professional Practice of the American Hospital Association and to the Executive Committee of the ASHP. The Council on Professional Practice returned the statement to the Joint Committee for modification. The modification was made and, finally, the "Statement of Principles Involved in the Use of Investigational Drugs in Hospitals" was approved by the Board of Trustees on September 29, 1957 and published in *Hospitals 31*:108 (Dec. 1) 1957 and *32*:44 (Jan. 1) 1958 and in the AMERICAN JOURNAL OF HOSPITAL PHARMACY *15*:232 (Mar.) 1958.

A wide variety of topics has been considered by the Joint Committee. Some of these include: principles of relationship between small hospitals and community pharmacists; control of narcotics and tax-free alcohol; educational programs for hospital pharmacists; prevention of medication errors; the formulary system; recruitment of hospital pharmacists; operating manuals for the pharmacy department; wastage of medicines; accreditation of hospital pharmacy internships; use of non-professional personnel; and others.

The Joint Committee of the A.H.A. and the ASHP offers numerous opportunities for representatives of pharmacy and hospital administration to explore subjects of mutual interest in a stimulating and healthy atmosphere of full, free discussion.

considerations in INPATIENT DISPENSING

by JACK S. HEARD

► WHY DOES THE HOSPITAL HAVE A PHARMACY? The answer of almost every reader would indicate the necessity for serving the pharmaceutical needs of the bed patient. Most hospital pharmacies have some other activities in addition to the primary one. Additional activities, some of which are indicated in the organizational chart shown in Figure 1, are well recognized. But let us remember that in the eyes of our professional colleagues—physicians, nurses, administrators, and in those of our patients—the "Reason for Being" of the hospital pharmacy is inpatient service.

Who is an inpatient? The answer is probably self evident but let us accept the definition as one who is admitted and assigned a bed. A correct, agreed upon definition is important because of types of service rendered, rates, insurance coverage, governmental support, etc. Note that there is an intermediate type of patient in Veteran's Administration and county hospitals known as domiciliary.

Types of Inpatient Service

For purposes of orderly discussion let us classify inpatient dispensing as follows:

1. Complete floor stock,
2. Entirely individual patient prescriptions, and
3. Combinations of 1 and 2

Complete Floor Stock

In this system all but the most unusual drugs are stocked on each patient unit. A system of stock containers for most of the commonly used drugs are made available to the nursing station for administration to the patient. This system is found most often in governmental and other hospitals in which charges are not made to the patient. Drugs which are expensive, rarely used, and those which the hospital wishes to keep under strict control (*e.g.* antileukemic

JACK S. HEARD is Chief Pharmacist at the University of California Hospital, Los Angeles, California.

drugs) are omitted from floor stock. These drugs are sent upon receipt of a prescription for the individual patient. One hospital of 1,200 beds fills only about 200 inpatient prescriptions daily under this system.

Some hospitals using the complete floor stock system still wish to charge for individual medications rather than include them in the daily room rate. There are various systems of receiving charges for these drugs. In each case the nursing service must initiate some report or charge form to accomplish the charging. For carefully worked out systems of this nature I refer the reader to the New York University Hospital and to the University of Indiana Hospital.

Advantages of the complete floor stock system are the immediate availability of drugs to the nurse, much lighter load of inpatient prescriptions, elimination of returned medication, and less necessity for the pharmacy to be open evening hours.

Disadvantages of the complete floor stock system are the lack of control by the pharmacy on what is dispensed to the individual patient, financial loss due to appropriation of medication by personnel and giving of medication without charge, increased inventory of each item, increased number of drugs lost due to obsolescence, and less chance for the Pharmacy to check dosages and dosage forms of drugs prescribed. In a hospital associated with a medical school, I believe it is a hazard to the patient for a pharmacist not to check at least some of the orders written by medical interns before the drugs are administered.

Patient Prescription System

In this system virtually all medications are supplied from the pharmacy on individual order or prescription. Since the pharmacy is then relied upon for quick service, of urgently needed drugs in many instances, service must be prompt and reliable. Some drugs (particularly injectables) may be kept on units on a replacement basis. Since revenue is frequently very important in institutions using this system, detailed methods of charging which account for all possible drugs are used. Cooperation of the nursing service is very important here and the chief pharmacist must frequently "police" the system and justify charges to patient, physician, and nurse. The system, because of its revenue producing nature, is found most frequently in private hospitals, and in smaller rather than large hospitals because of the individualized service.

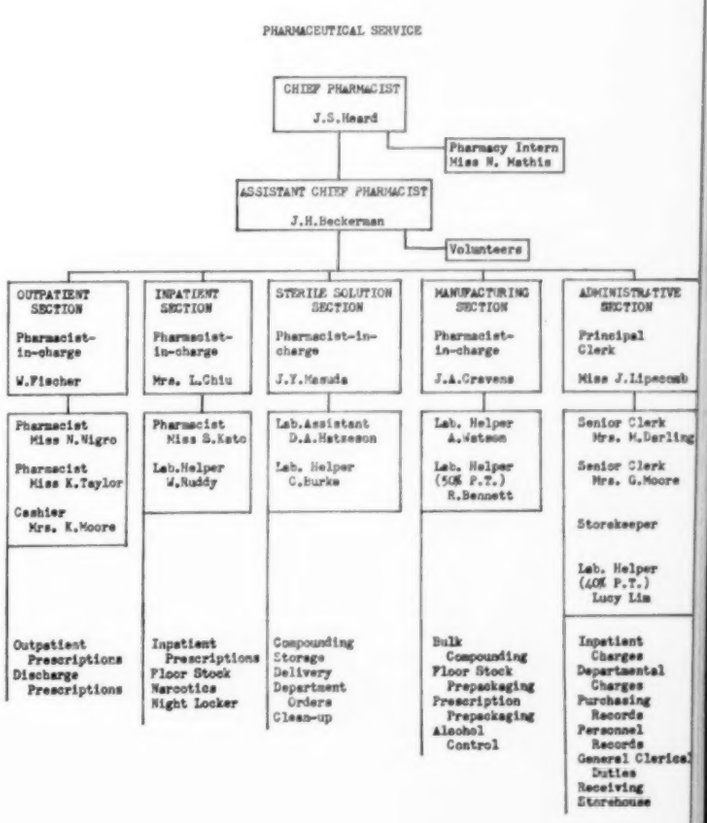
Advantages are, of course, complete control of production of pharmacy revenue, control of dosages and dosage forms of drugs administered to patients, control of inventory, and opportunity for closer liaison among pharmacist, nurse, and physician in pharmaceutical matters.

Disadvantages are the personnel expense involved, delays in obtaining medication for administration to patients, and greater necessity for providing off-hour service or emergency cabinets.

Combinations of Patient Prescriptions and Floor Stock

In this group are those institutions which use the individual prescription system as their primary means of supplying patients, but which have at least twenty or more drug items (in addition to narcotics and hypnotics) on floor stock. This system is probably the one most commonly used in hospitals today. While it varies considerably, it starts with a basic list of floor stock. Usually included are common non-prescription drugs, and many drugs not suitable for individual prescriptions and charges. Some examples of these are skin testing material in vials containing ten tests, multiple dose vials of inexpensive drugs used only once or twice per patient (atropine, epinephrine, etc.), ophthalmic solutions, and certain ointments. Each hospital determines the average daily cost of these drugs per patient through experience and includes this charge in the daily rate. In comparing rates from one hospital to the next the amount of "free floor stock" should be taken into account.

In setting up an inpatient prescription system, a routine on the nursing service must be developed. Basic elements are the daily checking of each patient's supplies, preparing orders for new medications and for those to be continued, sending orders to the Phar-



macy, checking medications received, and following a careful routine of administration of these medications.

The advantages and disadvantages of this combined system are similar to those of each of the two systems mentioned above, in proportion to the ratio of floor stock to individual prescriptions. If properly balanced, the best features of each may be realized. Factors to be considered are the amount of revenue from individual charges which must be earned, the types of preparations being used, the amount of training of the prescribers (and their supervision), the quality and amount of service the pharmacy is able to perform, and the communication facilities.

Before discussing techniques let us review the basic features which differentiate an inpatient prescription from an outpatient prescription. When a physician prescribes drugs for an inpatient he usually specifies the *frequency* of dosage of a particular drug but not the *duration* of its use. The drug is administered until ordered discontinued by the physician, unless an automatic stop order system is in effect in the hospital. Therefore, the pharmacist determines the amount of medication to be dispensed, taking into account the number of tablets, capsules, ampuls, etc. needed per dose, the number of doses per day, and the number of days supply a patient should receive according to hospital policy.

In the nursing profession it is axiomatic that a nurse know what medication she is administering and that she administer it according to the directions written by the physician. Therefore, it is almost a universal custom for the pharmacist to put the *name* of the drug and other pertinent information, but *not* the directions, on the label. There will, of course, always be exceptions to this policy. These may arise because of obscure directions, difficult calculations, or other special situations.

Techniques

There are three techniques commonly employed in getting prescription information to the Pharmacy so that medication may be furnished for the patient:

1. Prescription is written on a separate blank by the physician,
2. Chart order is transcribed by the nurse, and
3. Carbon copy of chart order is sent to the pharmacy

Separate prescriptions are written in many military hospitals. This system has some advantage from the pharmacist's point of view as it establishes the same relationship as found in the outpatient service and retail pharmacy. It has some disadvantage in that the physician may not have charted an order for which he has written a prescription. This leaves the nurse without authority to administer the drug. The system is not favored by many physicians as they traditionally are used to writing all of their orders in the patient's chart and leaving all further details to hospital personnel.

The most common system used at present is that in which the nurse transcribes the physician's charted order onto another document and sends it to the pharmacy for filling. There are two variations of this system: (1) the order is transcribed onto a prescription blank to which is attached a charge form (in charging hospitals) or (2) the order is transcribed onto a form which is used by the pharmacy as a prescription which is priced and sent to the cashier as a charge. This form may be in duplicate and one copy kept in pharmacy as a prescription record if desired.

The system of using a carbon copy of the physician's charted order as a prescription is used by three hospitals in Los Angeles. Since this is the system used at the University of California Hospital at Los Angeles, I will describe the details briefly.

The documents involved are Doctor's Order Form, Pharmacy Request and Charge Form, a completed prescription, and a patient's bill. The steps involved are as follows:

1. The clerk on the inpatient unit makes up a patient's chart including the Doctor's Order Form, a two part form (using "No Carbon Required" paper) which is addressographed on the original and on the back of each perforated part of the second sheet.

2. The physician writes all his orders on the form, in the same manner as with other systems. The clerk or nurse removes the section of the second sheet containing any drug orders, clips it to an addressographed Pharmacy Request and Charge Form, and sends them to the Pharmacy. Note that no writing is required by nursing personnel.

3. The set of forms is received in Pharmacy (by pneumatic tube), stamped by a Simplex time and numbering machine, and put in a box on the inpatient prescription case.

4. The pharmacist determines the medications needed, stamps the prescription number, determines the dosage form, size of dosage, and quantity needed, and fills the prescription.

5. The pharmacy clerk sends the medication to the inpatient unit, prices the prescription and charge form, sends the charge form to the cashier, and files the prescription in the inpatient prescription file according to its number.

6. To obtain a refill, the nurse writes the prescription number on the addressographed Pharmacy Request and Charge Form and sends it to the Pharmacy. The Pharmacy clerk looks up the prescription and clips it to the Charge Form and gives it to a pharmacist who fills it. The prescription is then filed again for future reference.

The above details are of course worked out into a routine so that 200 prescriptions may be filled in a day by one to two pharmacists and a clerk.

ORIGINAL

04818

(Addressograph Plate)

UNIVERSITY OF CALIFORNIA HOSPITAL
MEDICAL CENTER, LOS ANGELES

DATE & TIME	STOP		DISPOSITIONS
5/1	①	Absolute bed Rest	
	②	Darvinerol 25mg P.O. stat	
		Fleming	
5/2	①	Compazine 5mg t.i.d	
	②	D.C. phenobarbital.	
	③	Dilaudid 2mg. i.n q 2-2 hours PTN.	
		Fleming	

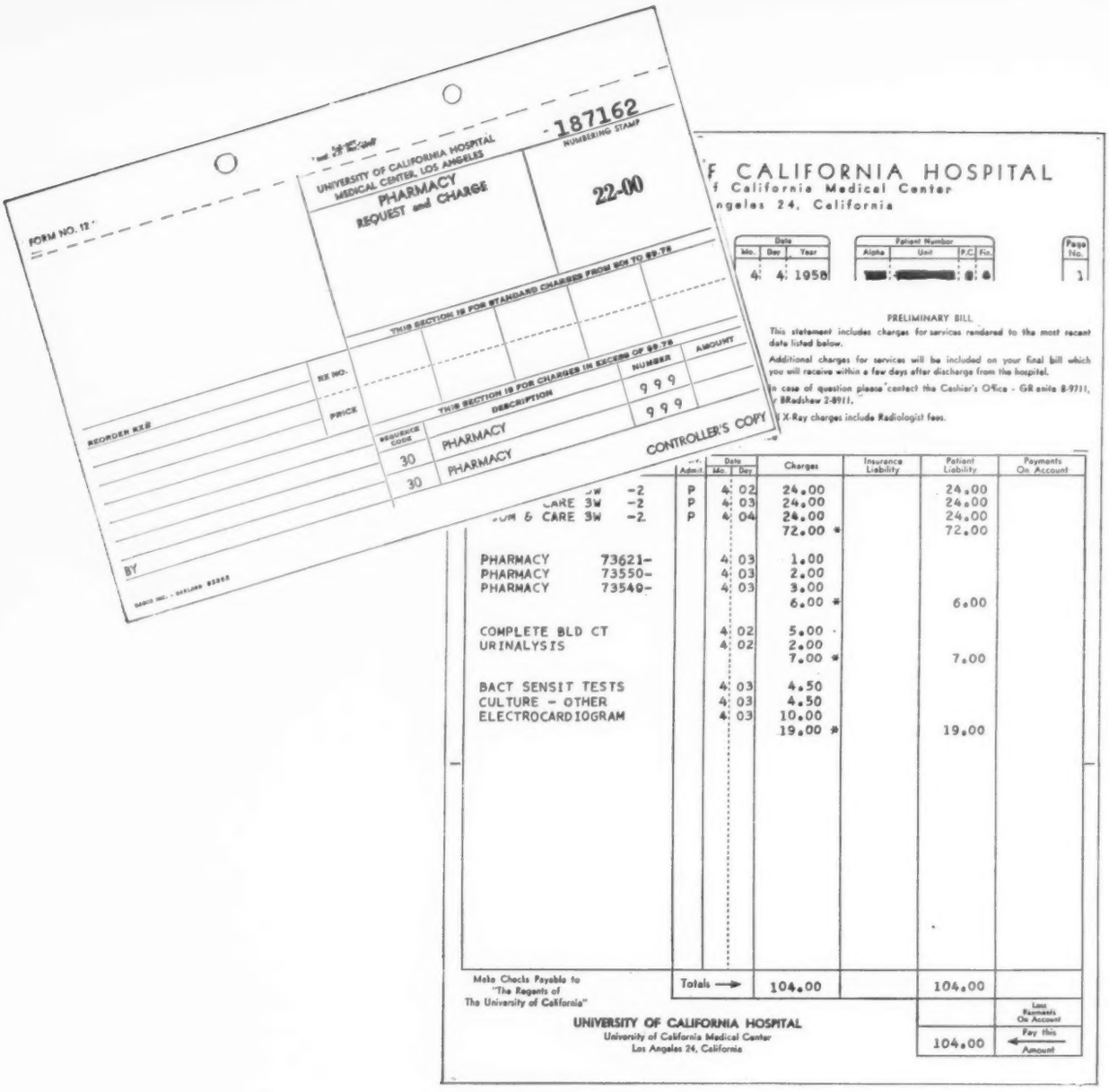
DOCTOR'S ORDERS

DUPLICATE

04818

5/1 ① Absolute bed Rest
② Darvinerol 25mg P.O. stat
Fleming

5/2 ① Compazine 5mg t.i.d
② D.C. phenobarbital.
③ Dilaudid 2mg. i.n q 2-2 hours
PTN.
Fleming


FORM NO. 12
UNIVERSITY OF CALIFORNIA HOSPITAL
MEDICAL CENTER, LOS ANGELES
PHARMACY
REQUEST and CHARGE
187162
NUMBERING STAMP
22-00
THIS SECTION IS FOR STANDARD CHARGES FROM $0¢ TO $9.75
THIS SECTION IS FOR CHARGES IN EXCESS OF $9.75
REORDER KEY
RX NO.
PRICE
DESCRIPTION
NUMBER
AMOUNT
SEQUENCE CODE
30 PHARMACY 999
30 PHARMACY 999
BY
CONTROLLER'S COPY
F CALIFORNIA HOSPITAL
f California Medical Center
ngeles 24, California
Date
Mo. Day Year
4 4 1958
Patient Number
Alpha Unit P.C. Fin.
Page No.
1
PRELIMINARY BILL
This statement includes charges for services rendered to the most recent date listed below.
Additional charges for services will be included on your final bill which you will receive within a few days after discharge from the hospital.
In case of question please contact the Cashier's Office - GRanite 8-9711, BRadshaw 2-8911.
X-Ray charges include Radiologist fees.
Admit
Date Mo. Day
Charges
Insurance Liability
Patient Liability
Payments On Account
CARE 3W -2 P 4 02 24.00 24.00
CARE 3W -2 P 4 03 24.00 24.00
CARE & CARE 3W -2 P 4 04 24.00 24.00
72.00 * 72.00
PHARMACY 73621- 4 03 1.00
PHARMACY 73550- 4 03 2.00
PHARMACY 73540- 4 03 3.00
6.00 * 6.00
COMPLETE BLD CT 4 02 5.00
URINALYSIS 4 02 2.00
7.00 * 7.00
BACT SENSIT TESTS 4 03 4.50
CULTURE - OTHER 4 03 4.50
ELECTROCARDIOGRAM 4 03 10.00
19.00 * 19.00
Make Checks Payable to "The Regents of The University of California"
Totals → 104.00 104.00
Less Payments On Account
Pay this Amount
104.00
UNIVERSITY OF CALIFORNIA HOSPITAL
University of California Medical Center
Los Angeles 24, California

Controls

Under any of the above systems a number of control measures must be instituted. Some of the most important ones are as follows:

1. Controls within the pharmacy.
   a. Any transferring of medicine from one container to another must be done by or under supervision of a pharmacist. Lay personnel become over-confident with a little knowledge and the controls must never be relaxed.
   b. The pharmacist must always be responsible for the quality and correct identity of drugs from the time they are received in the pharmacy to the time they are dispensed on prescription.
   c. All prescriptions and other orders must be double checked for correctness of medication and label. Of particular importance is the use of proper control labels. Points to check on inpatient prescription labels are spelling, dosage, prescription number (if used), patient's name and location. As the pressure of work increases the need for better controls becomes even greater.
2. Controls involving pharmacy, nursing and medical staff.
   a. By working through the Pharmacy Committee, the Chief Pharmacist should endeavor to have only drugs which are well accepted in medical practice used in the hospital.
   b. The pharmacy should aid in the nursing serv-

ice's control system for the administration of medicines. This is consistent with the general feeling that the hospital pharmacist is concerned with medications up through the point of administration to the patient.

c. Prevention of drugs passing into unauthorized hands and of out-dating and obsolescence of floor stock drugs is a function of the hospital pharmacist.

d. Financial control is always a concern of the hospital pharmacist, both in respect to conserving floor stock and in receiving all patients' charges which are due.

e. The maintenance of the correct dosage schedule for each prescription drug for each patient is automatically monitered by the pharmacy under the prescription system using numbered prescriptions.

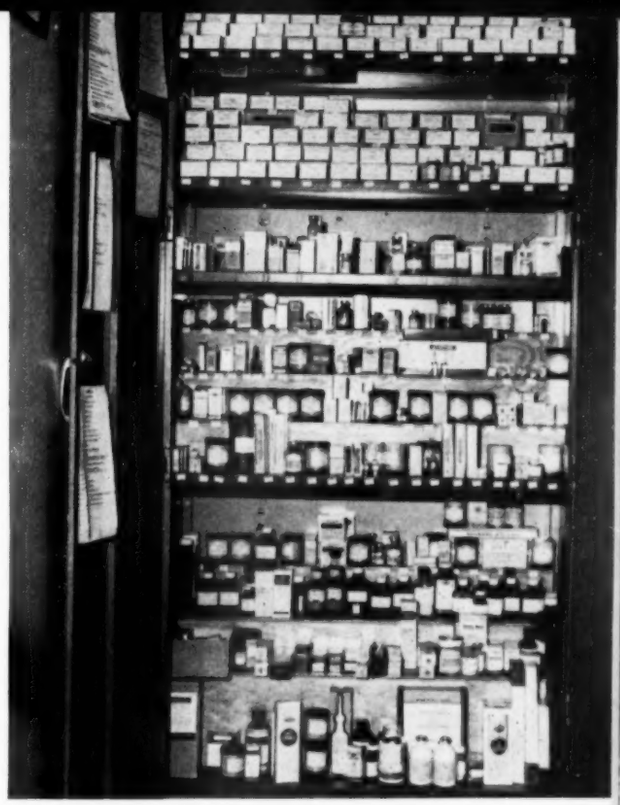
Hours of Operation

Although the hours of operation of hospital pharmacies vary greatly, certain patterns may be observed. Governmental hospitals with large floor stocks of drugs tend toward an 8 A.M. to 5 P.M. operation Monday through Friday and are generally closed on the weekend. The larger the proportion of drugs dispensed on prescription, the longer the hours the pharmacy tends to remain open. Private hospitals seem to tend toward evening hours (up until 9 or 10 P.M.) and service on weekends until 5 or 6 P.M. The practice of private physicians making their hospital calls in the early evening is the principal reason for the evening hours in private hospitals.

Teaching hospitals in many cases have evening hours in the pharmacy because of the schedules of the house staff. Interns and residents on many services, particularly surgery, are unable to make their rounds until the evening hours. At that time they write many orders for new drugs and change old orders.

Coverage When Pharmacy Is Closed

In almost every hospital the evening and night nursing supervisors are relied upon to some extent to obtain medication when the pharmacy is closed. In the majority of hospitals, nursing supervisors have keys to the pharmacy and may enter it during closed hours to obtain medication needed before the pharmacy is open. As a rule, they have access to all drugs except narcotics, and they may obtain drugs at their discretion. In almost all cases they may do no compounding whatever. While, throughout the years, this system has been somewhat workable, I have seldom seen a Chief Pharmacist or a Nursing Director who is very comfortable about it. The extra responsibility assumed by the nurse, the possible liability of the hospital, the loss of charges, the loss of stock control, and other factors are disadvantages in this system.



Night emergency locker

An increasingly popular system is the use of a "Night Emergency Locker" maintained by the pharmacy for the use of the evening and night nursing supervisors. These are of varying scope, size, and design and are located in an area convenient to the nursing office. The stock in them is usually prepackaged in very small amounts and so arranged that items are easily found and checked for replacement. If the stock is complete enough, the nursing service is very receptive to this system as it saves them time, cuts down the chance of error in dispensing, reduces friction between pharmacy and nursing over accounting as to what was dispensed, and helps fulfill the prime objective of "getting the pill to the patient."

Backing up the above systems of coverage when the pharmacy is closed is the pharmacist-on-call. While any hospital pharmacist should always consider himself technically on call, the formality of the call system will vary with the variety of floor stock available, the completeness of the Emergency Locker, the activity at night, etc. At the University of California Hospital at Los Angeles, each of the seven staff pharmacists is on call one night weekly; he is responsible for leaving a telephone number with the Nursing Service so that he may be reached at any time during the night. While there are frequent calls for information, the number of emergency trips to the hospital is only about 5 per month.

handling of

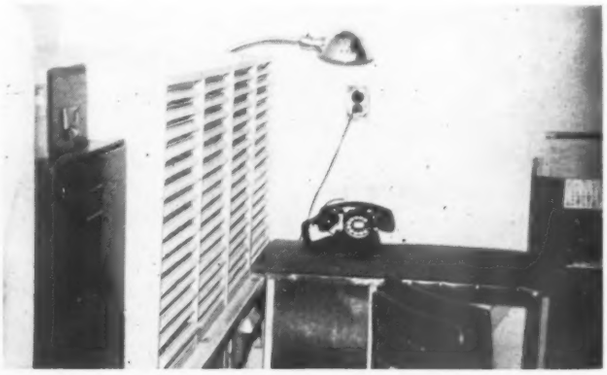
AFTER HOUR MEDICATION REQUESTS

by R. G. Henry

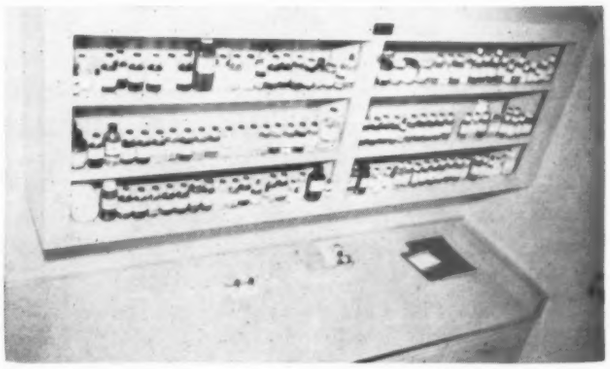
► THE HANDLING OF AFTER-HOUR MEDICATION REQUESTS in hospitals varies; however, I believe that most hospitals have an emergency night box, an emergency drawer, an emergency cabinet or the medications are distributed throughout the pharmacy. Prior to June 13, 1953, a similar situation with problems existed at Madison General Hospital. On that date the pharmacy moved to new and larger quarters which provided enough space for our night emergency room. This is an eight by twelve foot area located within the main pharmacy, which is accessible from the corridor and the pharmacy. By showing illustrations, perhaps I can clarify the agreement and the uses of the particular room and some of the problems that it has helped solve.

1 **Madison General Hospital. A bed capacity of 360 beds plus 45 bassinets. There are seven residents, 10 interns and 198 doctors on the Medical Staff. The pharmacy staff consists of four pharmacists, two pharmacy interns and one clerk-secretary.**

2 Nursing Supervisor with an after-hour request to be filled. The night emergency room is not intended for the nursing service personnel to practice the art of pharmacy, but to take care of emergency situations in the best possible manner when the pharmacy is closed. Entrance through this door is to the emergency room only and not to the main pharmacy—the lock on the night emergency room door does not conform with other locks within the main pharmacy. The nursing service has sole possession of the key to this door.

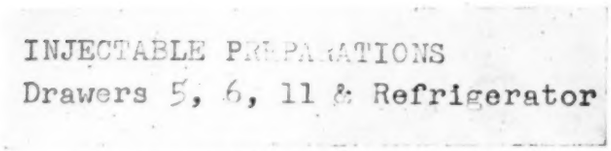


3 **Refrigerator, information files, Kardex file, telephone and desk. During the daytime this room is used as an office by the pharmacy clerk-secretary. All of the incoming calls are screened and channeled here.**



4 **Opposite side of the room—shelves, bottles, drawers, and counter top.**
Night emergency room reference book. The counter top is used to display new medications.

5 Intravenous fluids—ordinarily the intravenous fluids are floor stock—these are preparations that are not too often used but are kept here to be readily available—this includes solutions such as Ringer's solution, sodium cloride 5%, dextrose 20% in water, and so on. Shelf with reference pharmacy books. Pharmaceutical catalogs. Equipment for the intravenous fluids. Distilled water and other solutions. Phlebotomy Set.



6 This room contains emergency preparations as well as a good representation of our pharmacy stock. The preparations are pre-packaged, sealed, sectionized and cataloged. There are 8 sections—oral preparations, oral inhalation preparations, injectable preparations, ophthalmic preparations, nasal preparations, otic preparations, rectal and vaginal preparations and topical preparations. This shows the introduction to the injectable section.

Chymar (Chymotrypsin) 5000 units/ ml. Drawer 5 I. M. only
Chymotrypsin See Chymar
Citrovorum Factor See Leucovorin
Coagulen 2.5 mg./ ml. 5 ml. Drawer
Coccidiostatin 1:1000 Refrigerator
Compenamine 300,000 Units Drawer 5 I.M. Only
Conco Red 1% 10 ml. Drawer 5 I.V. (Diagnosis)
Coramine 20 ml. (Nikethamide) Drawer 5 & Emergency Tray Sub-Q, I.M., I.V.
Cortate Acetate Pellets (Desoxycorticosterone) Drawer 5 For Sub-Q IMPLANT
Cortef 50 mg./ml. 5 ml. (Hydrocortisone) Drawer 5 For I.M. USE ONLY
Cortef (Solu) See Solu-Cortef
Corticotrophin Zinc See Cortrophin

7 This shows a page from the injectable section. The preparations are alphabetized, cross-indexed, location of the medication and other pertinent information.
Examples:
Chymar (Chymotrypsin) 5000 units/ml.—5 ml. Drawer 5 I. M. Only
Coramine (Nikethamide) 20 ml. Drawer 5 & Emergency Trays, Sub-Q, I. M. I. V.
Cortrophin—Zinc 40 units/ml.—5 ml. Refrigerator I. M.

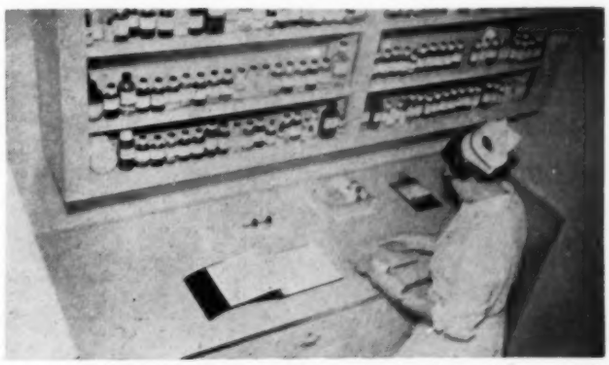
Tablet No. 338 Phenacetin
Liquid Shelf 1 250 mg./ 5 ml. distilled water for aqueous solution. Tetracycline
Liquid-Shelf 1 100 mg./ ml. Tetracycline
Liquid-Shelf 1 125 mg./5 ml. Tetracycline
Tablets No. 2 Tetracycline
Tablet No. 3 Tetracycline
Tablet No. 4 Tetracycline
Tablet No. 5
Tablet No. 845
Tablet No. 849
Tablet 851
Shelf 1 2.5 mg./ 5 ml.

8 Showing the arrangement of the oral preparations. Alphabetical arrangement, cross-indexing, location and other information.
Example:
Achromycin (Tetracycline)
Tablet 250 mg. Tablet No. 4
A preparation of this nature is in great demand so we generally have four bottles of the preparation in the night emergency room.

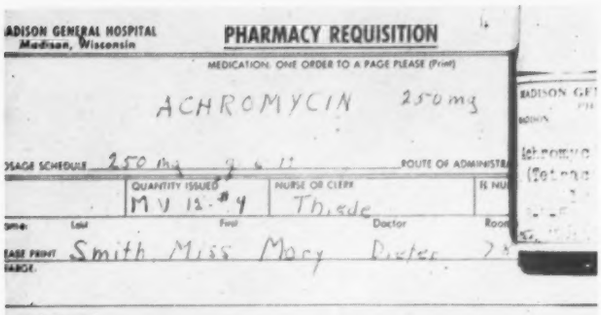
9 The next few slides show how easy and efficiently the nursing supervisor takes care of an after-hour medication request. Looking in the book to find the location of the preparation. The preparation is Achromycin 250 mg., Tablet No. 4

10 Medication is a tablet—Achromycin, 250 mg. tablet No. 4. The tablets and capsules are put in seven dram vials, sealed with a celon seal and a number is put on top of the vial—Kum-Kleen seal is used.

11 After the medication has been found—all the nurse has to do is to write the patient's name and room number on the bottle.



12 Taking the number off the top of the vial or bottle and placing it on the requisition.



MADISON GENERAL HOSPITAL
Madison, Wisconsin

PHARMACY REQUISITION

MEDICATION: ONE ORDER TO A PAGE PLEASE (Print)

ACHROMYCIN 250 mg

USAGE SCHEDULE 250 mg q 6 H — ROUTE OF ADMINISTRATION

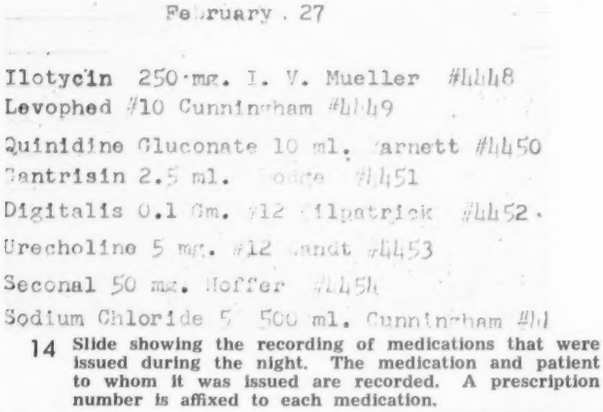
QUANTITY ISSUED	NURSE OR CLERK	IS NU
M V 12-#4	Thiede	

Date — Last — First — Doctor — Room

CASE PRINT MARGE: Smith Miss Mary Dieter 2

OFFICE COPY

13 **Requisition with the bottle of Achromycin, 250 mg. tablets. The bottle covers the route of administration —in this instance it was oral. The route of administration indicates in which section of the reference book the nurse should look to find the location of the medication. The Requisitions are left in the emergency room and the next morning the medications that have been issued during the night are recorded, the medications are replaced in stock and the emergency room is once again ready for service. An average of ten medications a night are issued from this room.**



February . 27

Ilotycin 250 mg. I. V. Mueller #4448
Levophed #10 Cunningham #4449
Quinidine Gluconate 10 ml. Garnett #4450
Gantrisin 2.5 ml. Hodge #4451
Digitalis 0.1 Gm. #12 Gilpatrick #4452.
Urecholine 5 mg. #12 Landt #4453
Seconal 50 mg. Hoffer #4454
Sodium Chloride 5 500 ml. Cunningham #4

14 **Slide showing the recording of medications that were issued during the night. The medication and patient to whom it was issued are recorded. A prescription number is affixed to each medication.**

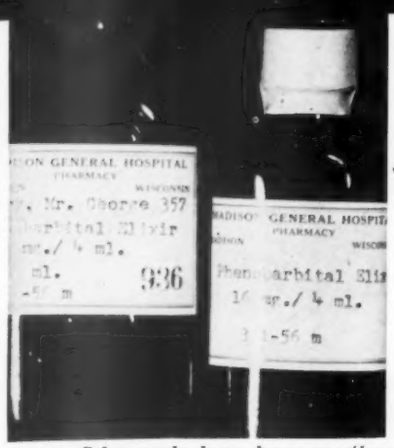
15 **If the nurse has to call the floor, the doctor or intern or contact the pharmacist on call, the telephone can be used without her leaving this area.**

16 **We have shown how this room is used to issue medications and how it is used as an office. This room is also used as a library and an information center for new medications. This is a picture of a resident looking in the index file to find in what section the particular information is in. This is the Stauffer system for cataloging information.**

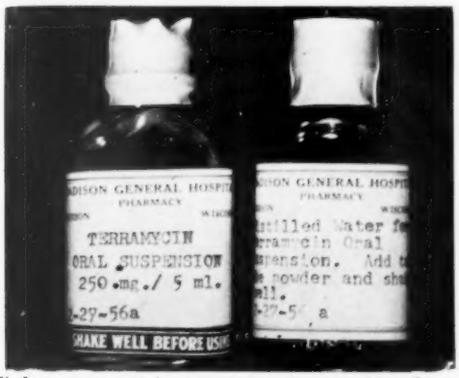
17 **The resident looking in the information file after having found the correct section. The pharmaceutical catalogs are kept in this room for a particular reason. Sometimes a doctor or intern can remember the name of the company but cannot remember the particular name of the medication. The catalogs are an aid to help find the preparation.**

18 **This is used by student nurses to obtain material on new medications, and information for their ward classes and pharmacology.**

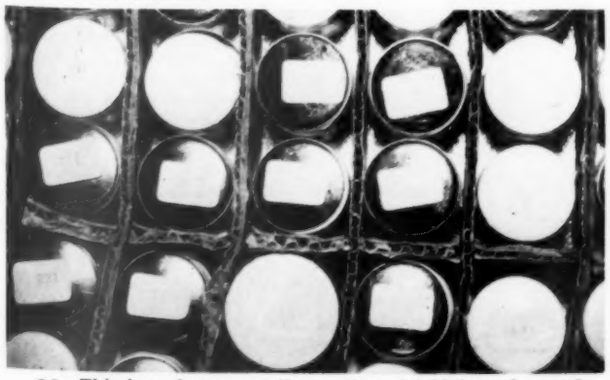
19 Residents and interns not only use this room at night but staff doctors use this during the daytime to obtain information. While we were taking pictures of this room, Dr. Tanner, a pediatrician, wanted some information on potassium phosphate. We found the material for him—he sat on our little red ladder that we were using, and we very willingly took his picture.



20 Celon seals have been mentioned a few times. This celon seal is a cellulose band: 31 x 25 millimeters in size. The seals retain their shape as long as they are kept in a special diluent but when exposed to the air, they dry and conform to the shape of the cover and the neck of the bottle as you see here. No doubt you have had contact with these seals before on a perfume bottle or perhaps on a container of spiritus frumenti. Pressure, in fact a lot of pressure, has to be exerted to break this seal, or sometimes it may be necessary to cut the band in order to open the bottle. The bottle on the left indicates how a prescription reaches the patient when the pharmacy is open. Patient's name, room number, identification of the medication with the potency expressed in mg. per ml. prescription number, date of filling and the initial of the pharmacist filling it. The bottle on the right indicates how the preparation is made up for the emergency room. This is prepackaged and sealed with the initial of the pharmacist and the date; the utmost care has been taken to issue medications to the patient after the pharmacy is closed. The medications have not been filled from a stock bottle nor has the original bottle been dispensed . . . this is as near as we can approach an individual prescription. When this preparation is delivered to the ward or floor with the seal unbroken it signifies to the nurse on the floor that this preparation has been filled by a registered pharmacist. The nurse has put patient's name and room number on the bottle.



21 Should it be necessary to prepare extemporaneously a preparation with a short expiration date, e.g., Terramycin Oral Suspension, as shown here, we have the proper amount of distilled water necessary to reconstitute the preparation. All that is required is to break the seals on the bottles and mix the preparations. This is done by the nurse on the floor after the medication has been delivered by the nursing service personnel.



22 This is a close-up of the section of tablets and capsules. The tablets or capsules are put in seven dram vials, sealed and with numbers stamped on top. The number aids in finding the particular preparation.

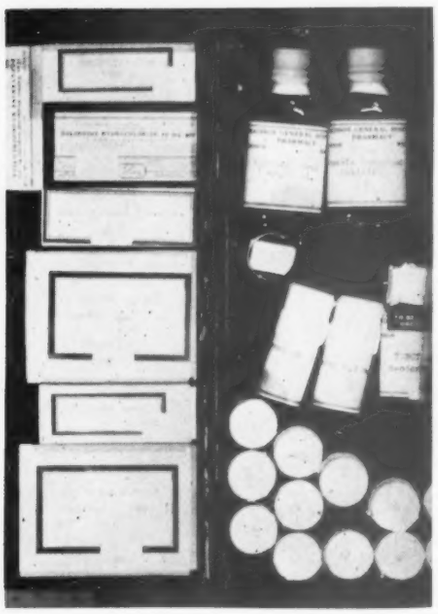
23 This is the injectable section showing how the ampuls are arranged in alphabetical order and in boxes.

24 This is another section of injectable preparations with cards identifying preparations and serving inventory purposes.

25 The inside of refrigerator—preparations are kept in numbered containers and an alphabetical listing is posted on the outside of refrigerator indicating numbered container.

26 The drawer to the left is ophthalmic preparations, arranged alphabetically. The drawer to the right is nasal and oral inhalation preparations arranged alphabetically. Note again the celon seals.

27 This is a preparation from the topical drawer. Should it be necessary to prepare a solution of Zephiran, as example: 1-2000: all that is necessary is to break the celon seal on the bottle and pour into the gallon of distilled water marked for Zephiran Solution.



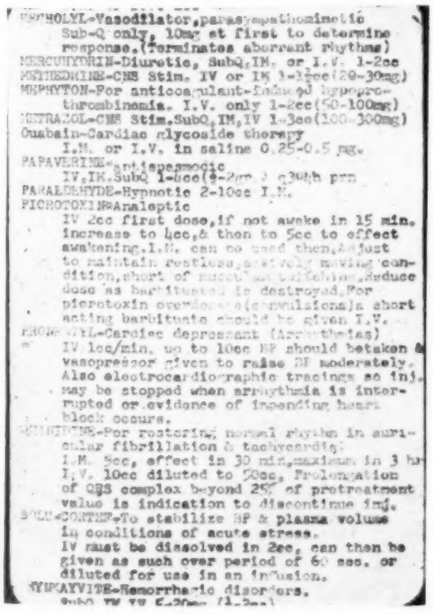
28 Narcotic preparations are also kept in the Night Emergency Room, with the preparations alphabetized and numbered for identification.

29 Another view of narcotic preparations kept in the Night Emergency Room.

30 A view showing the top of the plastic emergency box. When an emergency arises on the floor either day or night it is not always feasible to obtain the medication from the pharmacy. To cope with this situation we have placed a plastic emergency box on every floor with the necessary medication and the equipment to administer medications. This box is 13½ inches long, 10½ inches wide and 5 inches deep. This box can be carried to the patient's bedside and eliminates the running back and forth from the treatment room to the bedside. The top view shows the arrangement of the medications and the syringes, needles, tourniquet, air-way, and diluents.

31 An arrangement of the vials and ampuls alphabetically. The white strip is for the identification of the preparation as well as for inventory purposes.

32 Another slide showing the arrangement of the ampuls and vials. The rubber band holds a white slip of paper on the ampuls. This serves two purposes—to insure that after the medication has been administered to the patient to have it replaced in stock—if the medication is not there to treat the emergency, the box is no good. The second reason for the white slip is to charge the patient for the expensive medications—such as vitamin K1.


METHOLYL-Vasodilator,parasympathomimetic
Sub-Q only, 10mg at first to determine response.(Terminates aberrant rhythms)
MERCUHYDRIN-Diuretic, SubQ,IM, or I.V. 1-2cc
MYTHEDRINE-CNS Stim. IV or IM 1-1½cc(20-30mg)
MNPHYTON-For anticoagulant-induced hypoprothrombinemia. I.V. only 1-2cc(50-100mg)
NETRACOL-CNS Stim.SubQ,IM,IV 1-3cc(100-300mg)
Ouabain-Cardiac glycoside therapy
I.M. or I.V. in saline 0.25-0.5 mg.
PAPAVERINE-antispasmodic
IV,IM,SubQ 1-2cc(3-6mg) q3&4h prn
PARALDEHYDE-Hypnotic 2-10cc I.M.
PICROTOXIN-Analeptic
IV 2cc first dose,if not awake in 15 min. increase to 4cc,& then to 5cc to effect awakening.I.M. can be used then.Adjust to maintain restless,purposeless moving condition,short of muscular convulsions.Reduce dose as barbiturate is destroyed.For picrotoxin overdosage(convulsions)a short acting barbiturate should be given I.V.
PRONESTYL-Cardiac depressant (arrhythmias)
IV 1cc/min. up to 10cc BP should betaken & vasopressor given to raise BP moderately. Also electrocardiographic tracings as inj. may be stopped when arrhythmia is interrupted or evidence of impending heart block occurs.
QUINIDINE-For restoring normal rhythm in auricular fibrillation & tachycardia.
I.M. 5cc, effect in 30 min,maximum in 3 hr
I.V. 10cc diluted to 50cc. Prolongation of QRS complex beyond 25% of pretreatment value is indication to discontinue inj.
SYLK-CONTIN-To stabilize BP & plasma volume in conditions of acute stress.
IV must be dissolved in 2cc, can then be given as such over period of 60 sec. or diluted for use in an infusion.
SYNKAYVITE-Hemorrhagic disorders.
SubQ,IM,IV 5-20mg (1-2cc)

33 This is the cover to the plastic emergency box. The preparations are listed alphabetically with some pertinent information on dosage to aid the intern, resident or doctor.

AFTER-HOUR MEDICATION REQUESTS

It was mentioned in the introduction that some problems existed before this system was put into effect. Here are some problems that have been solved at Madison General Hospital:

1. The nursing service personnel do not have to enter the main pharmacy to search for the desired medication.
2. By having emergency preparations centrally located and ready to use we are in a good position to handle disaster situations. This has proven valuable in emergency situations that have arisen in the past.
3. Another important problem that has been solved is that information is available to the house staff and the medical staff day and night.
4. With this service of having the preparations prepackaged and sealed with the celon seal — the utmost care has been taken to issue medications to the patient after the pharmacy has closed. No pour outs or count outs from stock bottle is done nor is the original bottle dispensed. This is as near as we can approach an individual prescription.
5. According to the Wisconsin Pharmacy Laws, pharmacy interns cannot fill prescriptions unless under the direct supervision of a Registered Pharmacist, thereby eliminating an intern taking after-hour calls.
6. Hospital personnel cannot enter the main pharmacy, thereby doing away with pilferage.
7. This system has reduced the after-hour calls to the pharmacist.
8. With the medications sealed, this prevents the nursing service supervisor from issuing one or two tablets to hospital personnel without the proper authority.

With this arrangement of preparations pre-packaged, cataloged, sectionized and alphabetized and sealed with celon seal—I believe a similar system could be utilized by a retail pharmacist taking care of the medications in a small hospital.

Having the night emergency room available, plus a pharmacist on call, I feel that the pharmacy is offering adequate twenty-four hour service to our hospital. I sincerely believe the pharmacy is contributing to better patient care, which, after all, is our main objective.

R. G. Henry is Chief Pharmacist at the Madison General Hospital, Madison, Wisconsin.

considerations in

OUTPATIENT DISPENSING

by THEODORE TANIGUCHI

Photo Courtesy U.S. Public Health Service

► THE OUTPATIENT DEPARTMENT OF THE HOSPITAL has become an essential service to the hospital and to the community. Although outpatient services originated from the need to care for the ambulatory indigent, the scope of outpatient services and the utilization of these services have increased considerably. The American Hospital Association reported a total of 73,500,000 outpatient visits in 1955 and 79,500,000 outpatient visits in 1956. These totals may be compared with a total of 47,700,000 outpatient visits only nine years ago, in 1949.

With the expansion of outpatient services and the volume of outpatient visits, hospital pharmacists providing outpatient dispensing services must be able to provide greater service and greater benefits to the patient and to the hospital.

Outpatient Department

The primary function of the outpatient service of the hospital is the care of the sick and injured, just as it is with the inpatient service of the hospital. The only difference is that patients utilizing the therapeutic and diagnostic services of the outpatient department of the hospital are ambulatory and do not occupy a hospital bed or bassinet. Other functions of the outpatient department are to provide facilities for the training of professional hospital personnel and the protection of the community health.

The continuity of patient care is the most important service that is provided by the outpatient department. Full utilization of ambulatory care, especially with convalescent patients, permits the hospital better utilization of its much needed beds and obviates an excessive patient load. The outpatient department must be so organized in relation to the inpatient service that it will assure this continuity of care.

There are several types of hospitals that operate outpatient departments. The American Hospital Association, in compiling its annual statistics on outpatient visits, divides hospitals into the following categories:

1. Short-term general and special hospitals, including the non-profit, proprietary, and City, County, and State hospitals.
2. Long-term general and special hospitals.
3. Psychiatric hospitals.
4. Tuberculosis hospitals.
5. Federal hospitals.

Of the 79,500,000 outpatient visits reported in 1956, short-term hospitals accounted for 59,700,000 or 75 percent of the total outpatient visits.

The number and types of clinics in the outpatient department of any hospital depend upon the needs of the community and the groups utilizing the outpatient services, the physical facilities available in the hospital, and the degree of specialization of the medical staff. Clinic departmentalization will generally follow the lines of medical specialization.

THEODORE TANIGUCHI is Chief Pharmacist at the King County Hospital System, Seattle, Wash.

Presented at the Institute on Hospital Pharmacy, Seattle, Washington, June 1957.

Classification of Outpatients

MacEachern[1] classifies outpatients into three groups:

1. Clinic patients.
2. Private patients.
3. Emergency patients.

Clinic patients are unable to pay a private physician, and for a nominal charge or at no charge, receive the diagnostic or therapeutic services of the outpatient department.

Private patients make use of the diagnostic or therapeutic services of the hospital, usually upon referral of their own physicians, and are charged the established rates for the service. There are two types of private outpatients, private referred patients and private clinic patients. A private referred patient is an outpatient who makes use of only the special service facilities of the hospital, such as the x-ray and laboratory departments, upon referral of his own physician. The hospital's report on a private referred patient is usually sent directly to the referring physician, and the patient usually remains under his care. A private clinic patient is an outpatient who makes use of the diagnostic or therapeutic services of the hospital, generally in an organized private clinic.

Emergency patients are received in the emergency departments of the hospital for care of accidents and for the treatment of conditions requiring immediate medical or surgical care.

Facilities of the Outpatient Pharmacy

Since outpatient departments are usually integrated with hospitals, the outpatient service facilities, such as x-ray, laboratory, pharmacy, etc., must also be integrated with the service facilities for the care of inpatients. The facilities should be located so that the greatest convenience is offered the departments most frequently serviced.

The Pharmacy Department requires the fullest integration of outpatient and inpatient services. In the smaller pharmacy departments, dual activities being performed by the same personnel at the same time, the entire pharmacy should be located near the entrance area of the outpatient department. However, with main floor space at a premium, larger pharmacy departments may be divided into several units. The outpatient dispensing unit must be in the outpatient clinic area, but the inpatient dispensing service, manufacturing, and storage areas may be located in other areas of the hospital. An arrangement of two units, located one above the other, provides many advantages, and may be connected by a stairwell and a dumbwaiter.

The semi-open type of prescription dispensing department seems to be the most desirable. Patients are allowed to see the pharmacist at work, but the actual operations are not visible.

There must be at least two windows for the handling of outpatient prescriptions. One window will be used for receiving prescriptions and the other window for dispensing medication to the patient. This eliminates a bottleneck which occurs when one window must serve two purposes. A third window for use by private patients or by the personnel for their own medications will facilitate the handling of these prescriptions.

The area for extemporaneous compounding should be a separate area of the dispensing pharmacy. This area should be located away from the general dispensing area, and must be completely equipped and stocked with all necessary prescription ingredients for accurate and efficient compounding. Combining both inpatient and outpatient compounding areas in the inpatient service may provide for a more efficient operation by centralizing compounding facilities and materials.

Personnel

All prescriptions dispensed from the Outpatient Pharmacy must be filled by registered pharmacists. Although various statistics have been given as to the number of prescriptions that may be filled per pharmacist, these figures are not valid since it is impossible to standardize dispensing conditions. The type of operation, the scope of service, pharmacy and administrative policies and procedures, and other factors will influence the number of prescriptions that may be handled by each pharmacist.

The use of nonprofessional personnel in the fast moving dispensing pharmacy should be kept at a minimum. These individuals should be assigned work away from the prescription dispensing area during the busy hours.

Flow of Work

In the operation of a small outpatient pharmacy dispensing service, prescriptions are most advantageously filled on an individual basis. The individual handling of the prescription provides the highest type of professional service, and serves to check on the correct handling of each prescription. This system may be used even as the volume of prescriptions increases, but speed, efficiency, and optimum utilization of personnel may be sacrificed.

Speed and accuracy are essential in the efficient operation of the Outpatient Pharmacy. The use of the production line method for handling outpatient prescriptions provides for speed without sacrificing accuracy.[2] The operation of the production line method of dispensing will vary from pharmacy to pharmacy, depending on such factors as the size and type of hospital and outpatient department, number of available personnel, hospital and pharmacy policies and procedures, and other considerations.

Basically, the production line may function in the following manner:

1. A pharmacist accepts the prescription from the patient at the receiving window of the Pharmacy. The prescription is checked for availability of the medication and for completeness and accuracy of the prescription as written by the physician. The prescription is then numbered and priced.
2. A claim check and/or a charge ticket is prepared, which includes the patient's name, the prescription number, and the price. The claim check and charge ticket are presented to the patient. The patient is requested to present the charge ticket to the cashier and pay for his prescription before he picks up his medication.
3. A pharmacist types all labels for prescriptions, checking on the clarity of the directions to the patient. The prescriptions are then sorted according to the classifications into which the pharmacy has been departmentalized.
4. Dispensing pharmacists are stationed in the departmentalized areas, where they are required to fill only those prescriptions which call for drugs located in their own area. This eliminates the necessity of the pharmacist going from one side of the pharmacy to the other in filling prescriptions, and thus provides for a more efficient operation.
5. If the prescription requires compounding, it is routed to the extemporaneous compounding area for special handling.
6. All completed prescriptions are then cleared through a supervisor who checks the completed prescription before dispensing it to the patient.
7. The name of the patient is called and the claim ticket compared with the number of the prescription. Oral instructions for usage, special precautions, and storage conditions should be given at the time that the prescription is presented to the patient.

Intradepartmental Control

The utilization of all registered personnel in the prescription dispensing area provides for a check on the accuracy and correctness of the prescription at each step in the production line. The completeness and accuracy of the prescription is checked first by the pharmacist receiving the prescription at the window.

A pharmacist typing the label is able to check on the clarity of the directions as he prepares the label. The pharmacist filling the prescription, while exercising personal care and accuracy, also checks the label. The pharmacist supervisor finally checks the completed prescription—the price, the label, the container, and the medication. The pharmacist dispensing the prescription to the patient is able to explain the directions for use, if necessary, and also give special handling and storage instructions.

The utilization of registered personnel also provides for flexibility in the dispensing pharmacy and allows for a rotation of duties in the production line.

Considerations in Efficient Dispensing Operation

Arrangement of Stock. The Pharmacy Department should be so arranged as to provide the most efficient methods of compounding and dispensing prescriptions. One method[2] is the departmentalization of various pharmaceutical preparations according to dosage forms, with pharmacists filling only those prescriptions for drugs located in their immediate areas. Another method[3] is the division of the pharmacy into three lines of operation—the prescription case containing the most commonly prescribed tablets and capsules, the dispensing stock, and the storage stock.

The Hospital Formulary. The use of a hospital formulary is advantageous since it provides for a standardization of basic pharmaceutical preparations, and allows for procedures promoting efficient dispensing operations.

Prepackaging. The packaging of preparations prior to dispensing in the quantities commonly prescribed will lead to a more efficient dispensing operation.

Labeling Procedures. The use of printed labels, printed labels with blank spaces provided for dosage variations, and rubber stamped labels on paper containers will increase the speed with which a prescription may be dispensed. The prelabeling of prepackaged containers with printed labels will also promote speed in dispensing.

However, I believe that all labels for outpatients should be typed individually with all of the necessary information to provide the patient with a personal prescription.

Extemporaneous Compounding. Keeping the number of prescriptions that must be compounded extemporaneously to a minimum will provide for a more efficient operation. This may be accomplished, with the cooperation of the Pharmacy and Therapeutics Committee and individual members of the medical staff, by the standardization of formulas and prefabrication of the preparations in bulk quantities.

Prescription Pricing. A prepared schedule of prescription prices must be maintained at the window where the prescriptions are received in order to efficiently handle this portion of the operation. The schedule must be followed for uniform and accurate pricing of each prescription. Rates should be established for the classes of outpatients who are able to pay for only a portion of their medical care, as well as for patients who are able to pay the full rate.

The Pharmacy Department should not be responsible for determining the ability or inability of the patient to pay for his medication. Social service personnel should evaluate these cases before admission to the clinics and assign a rating based upon their ability to pay for all outpatient services. Patients who are able to pay the full rate should be charged at the rates that are prevailing in the local retail pharmacies.

Outpatient Cashier. One of the greatest burdens in the handling of outpatient prescriptions is the collecting of prescription fees. I do not believe that the pharmacy should collect these fees. A cashier should be provided for all of the outpatient department collections and should be located in the clinic area close to the pharmacy. An outpatient cashier eliminates the handling of cash by the pharmacy and also keeps the patient partially occupied while he is waiting for his medication.

Handling of Refills. A policy requiring new prescriptions for all medications provides the most efficient method for handling medication renewals by the pharmacy. This policy also provides for an entry being made into the patient's medical record every time the patient is seen by a physician, and allows for the evaluation of the patient's therapeutic program at each visit. Since it is not always possible in the busy outpatient department for the patient to be examined by the same physician, all entries into the medical record, including medications, are definitely important in the therapeutic management of the patient. If refilling of medications is permitted without entry into the medical records, much of the value of the patient's therapeutic program may be lost.

Provisions should be made, however, to supply adequate quantities of medication between clinic appointments. This is especially important where there are quantity limitations in the dispensing of medications.

A procedure for handling such medication refills may be described as follows: Original prescription specifically marked "Refillable" may be honored at the pharmacy for those patients who will require refills between clinic appointments. The pharmacy will indicate on the label that the prescription is refillable and, when the medication is exhausted, the patient should present the container at the pharmacy window. Additional refill requests should not be accepted for patients without further clinic appointments, as this may contribute to chronic medication.

Private Prescriptions. Prescriptions from private patients being treated by the outpatient medical staff may be filled by the pharmacy, but there should be no solicitation for these prescriptions. Prescriptions originating from outside of the hospital should not be filled in the hospital pharmacy. The hospital pharmacy also should not offer over-the-counter items for sale to the outpatients.

Personnel Prescriptions. Special methods may be provided for the handling of personnel prescriptions to facilitate their prompt filling and dispensing. One method is the use of a separate window to handle employee and staff prescriptions and other requests.

The policies governing prescriptions and medical care of the personnel should be included in the policies concerning general health care of the personnel. Policies must also be established for the sale of drugs and other supplies to employees by the pharmacy.

Patient Satisfaction and Public Relations

Prescriptions being received and dispensed from the outpatient pharmacy must be handled with dispatch and the utmost courtesy. The compounding and dispensing of outpatient prescriptions must be performed with speed and accuracy to minimize the time required of the patient to wait for the medication.

Suitable facilities should be provided for patients waiting for their medication. The outpatient usually is not in good physical condition, and a definite hardship may be created if he is kept waiting for a long period of time. Other reasons for minimizing the patient's waiting time for medication are: (1) Patients are not able to return at a later time for their medications since they may have traveled a long distance to attend the clinic, and (2) Hospital pharmacies do not provide delivery service, as do some of the retail pharmacies, and therefore patients are required to wait for their medications.

The facilities of the waiting area may also be utilized for public health education. Public health education is a function of the outpatient department in which the pharmacy may actively participate. Literature may be distributed and displays set up during public health campaigns and immunization drives. Displays may also be promoted during National Hospital Week and National Pharmacy Week.

Opportunities for Pharmacy Service

Pharmaceutical Service to the Outpatient Department. In addition to the dispensing of medications to outpatients, consideration must be given to the pharmaceutical service that is provided in supplying the outpatient clinics. While the pharmaceutical service required by many of the clinics will be of a routine nature, there are several specialty clinics where pharmaceutical service may be developed or increased.

The emergency room must be supplied with the various antidotal materials and information required in the treatment of accidental poisonings.

Some of the specialty clinics may require special preparations that must be prepared in the manufacturing laboratory of the pharmacy. These products may include such items as special packages of sterile ophthalmic solutions and sterile solutions for use in bladder irrigations.

Allergy patients are treated primarily as outpatients and must be provided with allergenic preparations of the proper dilution. The hospital pharmacist is in an excellent position to provide this service, without establishing an elaborate unit for the preparation of the allergenic extracts. Allergenic extracts may be purchased in concentrated form, and then diluted, as necessary, using aseptic technique.

Dispensing of Investigational Drugs. All investigational drugs and clinical trial drugs being used by outpatients should be dispensed from the pharmacy. It is in the interest of patient safety that these medications be properly labeled and controlled. Every effort should be made for cooperation with the medical staff in the proper handling of these investigational and clinical trial medications.

Professional Relations. It may be desirable for members of the Outpatient Pharmacy to periodically visit with the medical staff of the outpatient department to discuss new products, prescription writing, the use of generic nomenclature, etc. These discussions may be conducted individually or in groups, and will provide a contact between the medical staff and the pharmacy. They will promote mutual cooperation and understanding, and thus improve outpatient care. Similar programs may be established between the pharmacy and the outpatient nursing staff.

Summary

With the increased scope of outpatient services and the increased utilization of these services, the hospital pharmacist with outpatient dispensing responsibilities must be able to provide greater service to the patient and the outpatient department of the hospital.

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PHARMACEUTICAL CONTAINERS and their economics

by STANLEY WEINBERG *and* J. R. CATHCART

► THIS ARTICLE ENDEAVORS TO DISCUSS glass containers and how they may be economically used to their best advantage.

At The Delaware Hospital we are currently engaged in the use of glass containers. Aside from the possible economical disadvantages of glass containers, let us analyze the other considerations in choosing a container to hold medicaments.

J. ROBERT CATHCART is Director of Pharmacy Service and STANLEY WEINBERG is a Staff Pharmacist and former Resident in Hospital Pharmacy at The Delaware Hospital, Wilmington, Del.

Advantages of glass containers

Glass containers possess the following advantages:

Good Appearance. A good professional appearance means a great deal to the patient. It increases the patient's confidence in the pharmacy and also this increases the confidence of the nurses and physicians in the pharmacy.

Identification. Many medicaments can be identified at a glance; thus, possible mistakes are avoided.

Cleanliness. The constant handling of a bottle does not affect its clean appearance.

Protection is afforded against:

a. *Moisture.* Many medicaments have their potency reduced or destroyed by moisture.

b. *Light.* Amber-colored glass containers prevent destruction by light waves which are harmful to some medicaments.

c. *Destruction.* Destruction of tablets or capsules by rough handling is avoided.

Disadvantages of glass containers

Some disadvantages of glass containers include:

Space. More space is needed to store bottles than slide boxes.

Breakage. Bottles are more prone to breakage than are slide boxes.

Cost. Bottles, if used only once, can be uneconomical.

Collection of Bottles

At The Delaware Hospital it is our practice to wash used bottles in order to have them available to be re-used to package medicaments.

Both floorstock and inpatient bottles are returned to the Pharmacy when empty. This is accomplished by the return of these glass containers in the baskets during the morning pickup.

Once the bottles reach the Pharmacy, the caps are removed and discarded and the different size bottles are sorted and are put into large boxes according to size. When these boxes are full they are taken to the storage area, where the bottles are put into large containers.

When a sufficient number of bottles has been accumulated, they are then washed. The clean bottles are put in the storage area until they are dry and their use is warranted.

Not all bottles are washed. Bottles containing the following are discarded: (1) Oily compounds, (2) Staining substances, (3) Extremely poisonous substances, and (4) Non-aqueous substances.

Equipment

At The Delaware Hospital we are very fortunate in that we have a program for the preparation of intravenous solutions in operation and, therefore, have the use of a bottle washing machine and an automatic timing device.

The bottle washing machine that we are now using is made by Heinicke Instrument Corporation, Hollywood, Florida, Model HW 5000. The electric timing device is also made by Heinicke Instrument Corporation in conjunction with the Trott Electronics Corporation, Rochester, New York. It is called the

TABLE 1. AMOUNT SAVED BY WASHING 15 ML. WIDE MOUTH BOTTLES WHEN LABELS ARE REMOVED IN A SEPARATE OPERATION

Number of bottles washed	2,550 bottles
Cost of one bottle	2.4 cents
Cost of bottles washed (purchase price)	$61.20
Time required to wash bottles	130 minutes
Time required to remove labels	120 minutes
Cost of labor per hour	$1.00 per hour
Total cost of labor	$4.17
Amount saved by washing bottles instead of purchasing new bottles	$57.03
Savings per bottle after one washing	2.25 cents

TABLE 2. AMOUNT SAVED BY WASHING 30 ML. WIDE MOUTH BOTTLES WHEN LABELS ARE REMOVED IN A SEPARATE OPERATION

Number of bottles washed	1,121 bottles
Cost of one bottle	2.8 cents
Cost of bottles washed (purchase price)	$31.38
Time required to wash bottles	48 minutes
Time required to remove labels	80 minutes
Cost of labor per hour	$1.00 per hour
Total cost of labor	$2.14
Amount saved by washing bottles instead of purchasing new bottles	$29.24
Savings per bottle after one washing	2.6 cents

TABLE 3. AMOUNT SAVED BY WASHING APPROXIMATELY EQUAL NUMBERS OF 15, 30, 120, AND 180 ML. BOTTLES WHEN LABELS ARE REMOVED IN A SEPARATE OPERATION

Number of bottles washed	675 bottles
Average cost of one bottle	4 cents
Average cost of bottles washed (purchase price)	$27.00
Time required to wash bottles	85 minutes
Time required to remove labels	80 minutes
Cost of labor per hour	$1.00 per hour
Total cost of labor	$2.77
Amount saved by washing bottles instead of purchasing new bottles	$24.23
Savings per bottle after one washing	3.6 cents

Automatictimer, Model HW-1000-1. A sterilizer, made by American Sterilizer Company, Erie, Pennsylvania, Model No. 66158 is used to remove labels separately, as noted in Tables 1, 2, and 3. There are many other models of washing machines available that would very adequately do the job of washing bottles.

Washing Cycle

By the process of trial and error we have determined that the best cycle for the timing device is 1½ minutes for the washing cycle and ¾ minute for the rinsing cycle. We have found that for the purpose of washing bottles, the distilled water cycle is unnecessary.

Set forth below are the experimental figures on different techniques used in washing bottles. It should be noted that in Tables 1, 2, and 3 there is additional time required for removing the labels, as this was done in a separate operation by the sterilizing machine. (Figures are shown for 15 and 30 ml. wide mouth bottles, and 4 and 6 ounce flint glass bottles only. Other size bottles could also be washed if warranted.)

We have determined that our bottles are washed at least four times. This would result in a savings of $1,819.60 a year with labor costs accounted for. Labor costs for the year amounted to $101.28. Due to the loss of bottles through breakage and outpatient prescriptions, we believe the figure would be more accurate if we were to consider the bottles as having been washed three times, thus yielding a yearly saving of $1,264.38.

As shown by the different methods of procedure, Tables 5 and 6 proved to be the most practical and economical. This was the process whereby the labels were removed and the bottles were washed in one operation.

The average cost of a 15 or 30 ml. bottle is 2.6 cents. By washing a bottle three (3) times, this brings down the cost to 0.6 cents per bottle. The cost of a cap is 0.65 cents, which brings the total cost of the bottle to 1.25 cents.* A slide box costs 2.5 cents* per box. Therefore, it is quite evident that besides the host of advantages bottles have over slide boxes, economically they can also be quite advantageous.

The bottle washing machine mentioned previously in this article, which was purchased at a cost of $1,540, included the automatic timer, a distilled water booster pump, and an automatic steam thermostat. With the money saved by washing bottles instead of purchasing new ones, the machine could be paid for in about 1½ years. The Heinicke Instrument Corporation now has a new model called the HW-5000 which lists for $1,675 complete.

*Based on previous purchase price.

TABLE 4. AMOUNT SAVED BY WASHING APPROXIMATELY EQUAL NUMBERS OF UNSORTED 15, 30, 120, AND 180 ML. BOTTLES WHEN LABELS ARE REMOVED DURING THE WASHING OPERATION

Number of bottles washed	577 bottles
Average Cost of one bottle	4 cents
Average cost of bottles washed (purchase price)	$23.08
Time required to wash bottles	70 minutes
Time required to sort bottles	20 minutes
Cost of labor per hour	$1.00 per hour
Total cost of labor	$1.50
Amount saved by washing bottles instead of purchasing new bottles	$21.58
Savings per bottle after one washing	3.7 cents

TABLE 5. AMOUNT SAVED BY WASHING APPROXIMATELY EQUAL NUMBERS OF UNSORTED 15 AND 30 ML. BOTTLES WHEN LABELS ARE REMOVED DURING THE WASHING OPERATION

Number of bottles washed	1,785 bottles
Average cost of one bottle	2.6 cents
Average cost of bottles washed (purchase price)	$46.41
Time required to wash and sort bottles	190 minutes
Cost of labor per hour	$1.00 per hour
Total cost of labor	$3.15
Amount saved by washing bottles instead of purchasing new bottles	$43.26
Savings per bottle after one washing	2.4 cents

TABLE 6. AMOUNT SAVED BY WASHING APPROXIMATELY EQUAL NUMBERS OF UNSORTED 120 AND 180 ML. BOTTLES WHEN LABELS ARE REMOVED DURING THE WASHING OPERATION

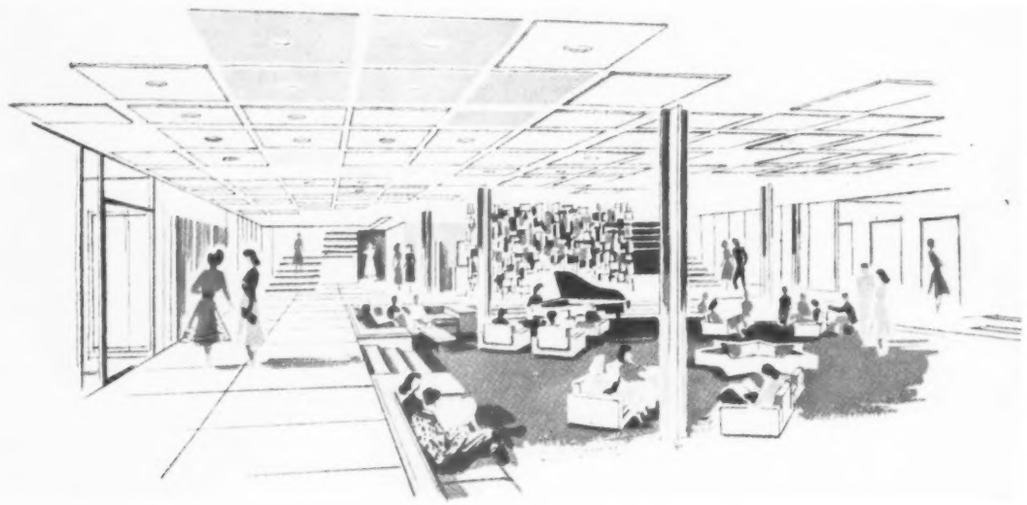
Number of bottles washed	333 bottles
Average cost of one bottle	5.5 cents
Average cost of bottles washed (purchase price)	$18.31
Time required to wash and sort bottles	85 minutes
Cost of labor per hour	$1.00 per hour
Total cost of labor	$1.45
Amount saved by washing bottles instead of purchasing new bottles	$16.88
Savings per bottle after one washing	5.1 cents

1958 INSTITUTES

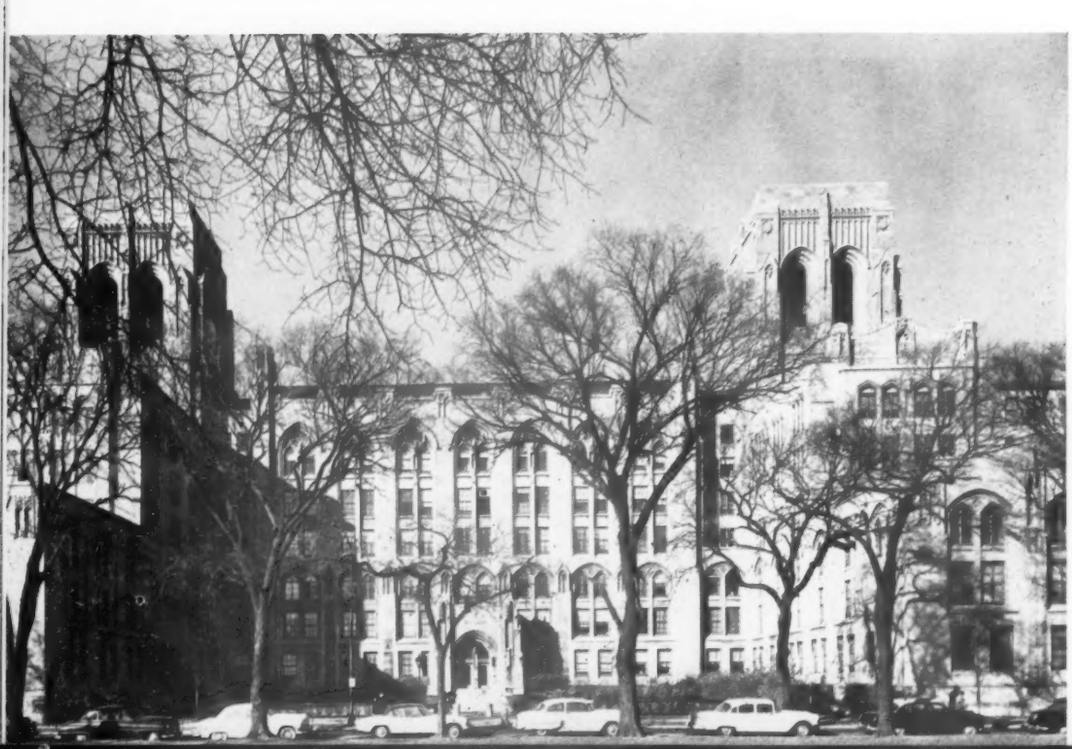
on hospital pharmacy

► HOSPITAL PHARMACISTS from all parts of the country will have an opportunity to participate in one of the two institutes scheduled during 1958. The first one will be held at the Temple University, Philadelphia, Pennsylvania during the week of June 16. The second institute is scheduled at the University of Chicago, Chicago, Illinois, July 28—August 1, 1958. Your attention is called to the fact that the second pharmacy institute for this year is somewhat earlier than in former years. Announcement and registration forms have been sent to all members of the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS as well as to all hospital administrators in member hospitals of the American Hospital Association. Registration for the institute is handled through the American Hospital Association and applications are accepted in the order received. In accordance with the policy for setting up this type of meeting, the number of registrants is necessarily limited.

In each institute—Philadelphia and Chicago—housing facilities will be available in dormitories at the universities. Special arrangments have been made for



CHICAGO



Above: View of Dormitory at University of Chicago. Left: University of Chicago Clinics, Billings Hospital.

Above: Peabody Hall at Temple University where enrollees will stay. Right: Philadelphia College of Pharmacy and Science

members of religious orders. Meals will be served in the university cafeterias and arrangements for housing and meals can be made when your application form is returned to the American Hospital Association.

Again, for the thirteenth consecutive year, the American Hospital Association will conduct the institutes in cooperation with the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. In both cases, the local hospital organizations and the ASHP affiliated chapter in each area are assisting and arranging local plans.

PHILADELPHIA

Program

Every effort has been made to incorporate the suggestions and ideas presented by Mr. Walter Frazier, Chairman of the ASHP Committee on Program and Public Relations and his committee members. The program will be based on five general themes—administration, bulk compounding and sterile products, dispensing, education and information, and expansion and special services—around which each day's discussions will be based. Every effort has been made to present a very practical program and although the 1958 institutes will follow the same general pattern as in the past, the topics under discussion should propose new methods and procedures for those who have been engaged in the practice of hospital pharmacy for some time, and offer valuable assistance and aid to the relative newcomer in this field.

Recent activity by the Joint Commission on Accreditation of Hospitals recommending that strong Pharmacy and Therapeutics Committees be established has prompted the advisory committee to again place this subject in the institute program, but to be presented in a somewhat revised fashion. Examination of hospital pharmacy literature also discloses that relatively little has been written regarding the hospital pharmacy budget. Therefore, the advisory committee has suggested that the subject "Let's Examine the Pharmacy Budget" be presented and that an acutal budget session be held, with discussants including the hospital pharmacist, administrator and controller.

Again this year, a clinic session will be held at the end of each day's program. The student body will be divided into groups of appropriate size, according to the bed capacity of the institution with which the student is associated. Each group will be assigned a group leader who will act as moderator during each session. Each group will be asked to (1) evaluate the day's program, (2) offer suggestions and ideas for improving the program, and (3) discuss the day's program in terms of its application to the operation of the student's pharmacy department. A report of

Submitted by JOSEPH ODDIS, Staff Representative, Council on Professional Practice, American Hospital Association, Chicago, Ill.

Faculties

C—Chicago
P—Philadelphia

ROBERT D. ANDERSON, Director of Pharmacy Service, King's Daughters' Hospital, Staunton, Va. (P)

KENNETH B. BABCOCK, M.D., Director of the Joint Commission on Accreditation of Hospitals, Chicago, Ill. (C)

MARTIN BARR, Ph.D., Associate Professor of Pharmacy, Philadelphia College of Pharmacy and Science, Philadelphia, Pa. (P)

ALLEN V. R. BECK, Director of Pharmacy Service, Indiana University Medical Center, Indianapolis, Ind. (C)

PAUL G. BJERKE, Director of Pharmacy Service, Luther Hospital, Eau Claire, Wis. (C)

ROBERT BOGASH, Director of Pharmacy Service, Lenox Hill Hospital, New York, N. Y. (P & C)

GROVER C. BOWLES, Director of Pharmacy Service, Baptist Memorial Hospital, Memphis, Tenn. (C)

RAY E. BROWN, Superintendent, University of Chicago Clinics, Chicago, Ill. (C)

ELLSWORTH R. BROWNELLER, M.D., Medical Director, Jefferson Medical College Hospital, Philadelphia, Pa. (P)

J. ROBERT CATHCART, Director of Pharmacy Service, Delaware Hospital, Wilmington, Del. (P)

ROBERT H. CATHCART, Administrator, Pennsylvania Hospital, Philadelphia, Pa. (P)

HOWARD F. COOK, Executive Director, Chicago Hospital Council, Chicago, Ill. (C)

JOSEPH CRISALLI, Chief of Pharmacy Service, U. S. Public Health Service Hospital, New Orleans, La. (C)

WINSTON DURANT, Assistant Director of Pharmacy Service, University of Chicago Clinics, Chicago, Ill. (C)

A. C. ENGLIN, JR., Controller, Jefferson Medical College Hospital, Philadelphia, Pa. (P)

HERBERT L. FLACK, Director of Pharmacy Service, Jefferson Medical College Hospital, Philadelphia, Pa. (P)

DON E. FRANCKE, D.Sc., Director of Pharmacy Service, University Hospital, Ann Arbor, Mich. (C)

LOUIS GDALMAN, Director of Pharmacy Service, Presbyterian-St. Luke's Hospital, Chicago, Ill. (C)

E. BURNS GEIGER, Director of Professional Relations, Pfizer Laboratories, Brooklyn, N. Y. (P & C)

LEO F. GODLEY, Director of Pharmacy Service, Bronson Methodist Hospital, Kalamazoo, Mich. (P)

ARTHUR HARTFELDER, Controller, Evanston Hospital, Evanston, Ill. (C)

LOUIS P. JEFFREY, Director of Pharmacy Service, Albany Hospital, Albany, N. Y. (P)

CLIFTON J. LATIOLAIS, Assistant Director, Audit of Pharmaceutical Service, University Hospital, Ann Arbor, Mich. (C & P)

RUSSELL F. LOVELL, Director of Pharmacy Service, Akron General Hospital, Akron, Ohio. (C)

JAMES McDONALD, M.D., Director of Research and Assist. Prof. of Ophthalmology, University of Illinois, Chicago, Ill. (C)

JOSEPH A. ODDIS, Staff Representative, Council on Professional Practice, American Hospital Association, Chicago, Ill. (P & C)

PAUL F. PARKER, Director, Division of Hospital Pharmacy, Washington, D. C. (P & C)

THEODORE SHERROD, M.D., Department of Pharmacology, University of Illinois, Chicago, Ill. (C)

MAE SHUEY, R.N., Supervisor of Central Services, Presbyterian Hospital, Philadelphia, Pa. (P)

SISTER M. BERENICE RIPPERGER, Director of Pharmacy Service, St. Mary's Hospital, St. Louis, Mo. (C)

SISTER M. GONZALES, R.S.M., Director of Pharmacy Service, Mercy Hospital, Pittsburgh, Pa. (P & C)

PETER SOLYOM, Director of Pharmacy Service, University of Chicago Clinics, Chicago, Ill. (C)

JOSEPH SPROWLS, Ph.D., Dean of the School of Pharmacy, Temple University, Philadelphia, Pa. (P)

CHARLES G. STEINMETZ III, M.D., Associate Professor of Ophthalmology, Jefferson Medical College Hospital, Philadelphia, Pa. (P)

JOSEPH V. TERENZIO, Executive Director, Knickerbocker Hospital, New York, N.Y. (P)

WILLIAM TESTER, Director of Pharmacy Service, University of Iowa Hospital, Iowa City, Iowa (C)

LINWOOD M. TICE, D.Sc., Associate Dean, Philadelphia College of Pharmacy and Science, Philadelphia, Pa. (P)

JOHN W. WEBB, Assistant Director of Pharmacy Service, Massachusetts General Hospital, Boston, Mass. (P)

GEORGE WEBSTER, Ph.D., Dean of the School of Pharmacy, University of Illinois, Chicago, Ill. (C)

ANN ZERCHER, R.N., Director of Nursing, Louis A. Weiss Memorial Hospital, Chicago, Ill. (C)

these clinic sessions will be made on the final day of the institutes. Faculty members will act as resource advisors and participate in the discussions only as they are invited to do so.

Another session designed specifically for student participation is "What Is *Your* Problem?" This will be a question and answer period and problem clinic. Selected faculty members will serve as discussants. The students will be asked to present specific pharmaceutical *problems* as they exist in their respective institutions. The discussants will attempt to analyze the problem and offer suggestions for a solution.

In both Philadelphia and Chicago, Tuesday evening will be "touring" night. Guided tours will be offered for those who wish to visit one or several of the pharmacy departments in the area. The local chapters in both cities are attempting to plan tours which will be of interest to a variety of people.

No specific time has been set aside for a discussion of equipment and "gadgets." However, the registrants are asked to bring along whatever new "inventions" and ideas they may have. Last minute arrangements for displaying such items can be made during the institute week.

Other important sessions will deal with communications, written pharmacy policies and procedures, filing and classifying information necessary for pharmacy management, systems for control and safety, new drugs, and around-the-clock pharmacy service. Complete programs with tentative faculty appointments are included on pages 410 to 413.

Local Committees

Members of the Philadelphia Hospital Pharmacists' Association and Illinois Society of Hospital Pharmacists are taking a leading role in making special arrangements for institute enrollees. Spearheading this interest and activity are the presidents of the local chapters—Herbert L. Flack and Winston Durant—respectively.

At both institutes, preliminary registration and an informal coffee hour will be featured on the Sunday evening preceding the institute from 4 p.m. to 9 p.m. A social hour, scheduled for Monday evening, will offer an unusual opportunity for relaxation and entertainment. These functions are sponsored by the respective local societies.

Register Early

As mentioned above, applications for participation in the annual institutes are accepted in the order received. Those planning to participate in either of the 1958 Institutes are urged to register as soon as the necessary application forms are received.

1958 INSTITUTES - programs

Monday, June 16, Philadelphia and July 28, Chicago

Hospital Pharmacy Administration

SISTER M. GONZALES, Presiding at Philadelphia (P)
CLIFTON J. LATIOLAIS, Presiding at Chicago (C)

8:00 A.M. Registration

9:00 A.M. Greetings and Orientation

9:15 A.M. Relationship of Pharmacy Service to the Hospitals

ELLSWORTH R. BROWNELLER (P)
RAY E. BROWN (C)

This session is designed to point out to the student that the pharmacy department is an important member of the total health team. The speaker will develop the theme of "patient oriented" services provided by the hospital, beginning with the Board of Trustees and pinpointing the place of the pharmacy department in the hospital as a total organization. Organizational lines of authority might be visually demonstrated or illustrated.

10:15 A.M. Established Principles, Standards, and Resources for Hospital Pharmacy

LEO F. GODLEY, PAUL F. PARKER, and JOSEPH A. ODDIS (P)
GROVER C. BOWLES, PAUL F. PARKER, and JOSEPH A. ODDIS (C)

This session will serve to point out that hospital pharmacy is no longer a new entity; that there are established principles, standards, and resources where information is readily available. A moderator and two panel members will present the topic in a conversational manner employing visual aids, magnetic boards, etc. An attempt should be made to demonstrate the relationship of the Joint Committee of the American Hospital Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS, the Joint Commission on Accreditation of Hospitals, the Policy Committee of the Division of Hospital Pharmacy. The background of the development of these groups and their actual relationship to the practice of pharmacy in the individual hospital should be presented. The moderator will introduce the subject and interject questions from time to time to keep the presentation directed toward the primary interest of the hospital pharmacy practitioners. From this session, the student must be made cognizant of the efforts that have been exerted in the past for the advancement of hospital pharmacy and of the resources presently available and at his immediate disposal. He must recognize the representation which is his at the national level.

11:15 A.M. Effective Communications for Hospital Pharmacy

E. BURNS GEIGER (C and P)

This session will include a discussion of the areas of communications which affect the hospital pharmacist in the daily operation of his department. How do we communicate? Why do communications at times "break-down"? What are the problems involved in communicating? The speaker will give examples of poor communications and will offer sound, simple suggestions for improving our communication skills as these affect our own department and other departments of the hospital.

1:30 P.M. Do You Have Written Pharmacy Policies and Procedures?

CLIFTON LATIOLAIS (P)
SISTER BERENICE RIPPERGER (C)

Writing a procedural manual is a continuing process. Too often, pharmacists look upon this as an ominous task, beyond the realm of accomplishment. This outlook is due, in part, to a lack of understanding of the basic reason for having a procedural manual. It should be stressed that such a manual is developed gradually, a little at a time, as the need arises. Basic advantages for having a manual should be presented. What should be included? How does one start? Samples should be distributed. Several manuals should be displayed.

2:10 P.M. Participation of the Pharmacist in Total Hospital Activities

ROBERT D. ANDERSON (P)
PAUL G. BJERKE (C)

The topic is intended to describe how the pharmacist can promote himself to become an active member of the administrative team by participating in activities such as department head meetings, Pharmacy and Therapeutics Committee, safety committee, disaster preparedness committee, forms committee, etc. In addition to participating in committee activities, what is the place of the pharmacist at medical staff meetings, clinical meetings, hospital recruitment activities, mass innoculation programs, guiding hospital tours, etc.?

3:05 P.M. Filing and Classification System for Hospital Pharmacy Management

HERBERT L. FLACK (P)
SISTER M. GONZALES (C)

Where is it? How did I file that? Why can't I ever find anything? These are some of the questions which confront us daily when we attempt to locate something in our files. The speaker will present a new system for filing and classifying information and material necessary for pharmacy management. The overall needs for having a systematic classification system for hospital pharmacy material, which is regularly used in the department over and above the reference material on drugs, will be described. Illustrative material should be distributed.

3:45 P.M. Clinic Session

Each afternoon, clinic sessions will be held. The student body will be divided into groups of appropriate size, according to the bed capacity of the institution with which the student is associated. Each group will be assigned a group leader who will act as moderator during each session. Each group will be charged with three responsibilities: (1) An evaluation of the day's program, (2) Suggestions and ideas for improving the program, and (3) Discussion of the day's program in terms of its application to the operation of the student's pharmacy department. The moderator must encourage total participation in the discussion. He will serve as recorder and report to the institute coordinator daily after each clinic session. At the end of the week, a clinic session is held on the stage before the entire institute body, in which the discussion leaders and institute coordinators participate. All members of the faculty act as resource advisors and participate in the discussions only as they are invited to do so.

Tuesday, June 17, Philadelphia and July 29, Chicago

Bulk Compounding and Sterile Products

ROBERT C. BOGASH, Presiding at Philadelphia
GROVER C. BOWLES, Presiding at Chicago

9:00 A.M. Services and Savings in a Bulk Compounding Program

J. ROBERT CATHCART (P)
WILLIAM TESTER (C)

This presentation should first, advance the *service* aspects of a bulk compounding program and secondly, justify the establishment of such a program through savings to the institution. It should develop the relation of a bulk compounding program to the formulary system. Students should be advised to keep records on all aspects of the bulk compounding to know where they are going and what the *actual* costs are.

9:40 A.M. Developing and Building a Bulk Compounding Program

CLIFTON J. LATIOLAIS (C & P)

The theme of the presentation should develop a logical sequence of establishing a bulk compounding program; the basic equipment necessary, and its justification; and the development of a long-range plan.

10:35 A.M. Symposium: Sterile Products in the Small Hospital
1. Small Volume Injectables
2. Surgical and Irrigating Fluids

J. Robert Cathcart and Leo F. Godley (P)
Sister Berenice Ripperger and Russell F. Lovell (C)

The symposium will deal with the central theme but will be presented in two parts by two speakers as indicated above. Each speaker will spend about 30 minutes developing his subject. After completion of both presentations, a question period will follow.

The presentation on "Small Volume Injectables" should develop the plan for a program suitable for a one or two man pharmacy department operation, and indicate the need to have definite plans from the very beginning. For instance, the program should begin with the still and autoclave, and notation of absolutely essential equipment. Such common products as water for injection, saline, procaine, potassium chloride and extemporaneous sterile products, should be discussed.

The presentation on "Surgical and Irrigating Fluids" should develop the convenience, safety, savings by making these solutions. Basic necessary equipment items should be described, as well as the logic for conducting such a program in the pharmacy department, rather than in the Central Supply Department. Demonstration of equipment, suggested work sheets, etc.

1:30 P.M. Symposium: Ophthalmological Medicaments
1. Clinical Needs
2. Techniques for Preparing

Charles G. Steinmetz III and John W. Webb (P)
James McDonald and Peter Solyom (C)

The symposium will deal with the central theme but will be presented in two parts by two speakers as indicated above. Each speaker will spend about 30 minutes developing his subject. After completion of both presentations, a question period will follow.

The presentation on "Clinical Needs" will be made by a physician and will include a discussion of current practices in the use of ophthalmic preparations. What services can be provided by the pharmacist in preparing special medicaments? What are the requirements of the ophthalmologist?

The presentation of "Techniques for Preparing" should include a discussion of equipment required, agents used, suggested procedures for preparing, etc. Visual aids should be employed, if feasible.

3:15 P.M. The Current Status of Aerosols (P)
Martin Barr

The presentation should include a discussion of the present and future use of aerosol medicaments. What preparations are presently available? How effective is this type of administration? What are the advantages and disadvantages? Should the hospital pharmacist prepare them? How feasible is this?

3:15 P.M. Dermatological Preparations (C)
William Tester

In this presentation, the speaker will distribute a number of dermatological formulas and supplement the material with a general lecture on the subject.

3:55 P.M. Clinic Session

6:00 P.M. Tour of Pharmacy Departments (P and C)

Wednesday, June 18, Philadelphia and Thursday, July 31, Chicago

Dispensing

Clifton Latiolais, Presiding in Philadelphia
Louis Gdalman, Presiding in Chicago

9:00 A.M. Use of Disposable Items in the Hospital
Leo F. Godley, Louis P. Jeffrey, Robert H. Cathcart, and Mae Shuey (P)
Paul F. Parker, Ray E. Brown, Peter Solyom, and Ann Zercher (C)

This session is a panel discussion. Participants will include an administrator, a nurse, and a pharmacist. The administrator will be responsible for discussing briefly the present extent of usage and future outlook in the use of disposable items and the resultant effect this will have in hospital practices. The nurse will be responsible for discussing the effect that use of some disposable items has already had with regard to certain nursing procedures. The pharmacist will be responsible for the specific area of pharmaceuticals; single-dose units (oral and injectable), individual ophthalmic units, single unit lubricating jelly tubes, etc. What effect will this have on hospital pharmacy dispensing practices?

10:15 A.M. Service Improvement in Dispensing
Robert C. Bogash (P and C)

The presentation will emphasize the necessity for dispatch! The speaker will advise fixed responsibility for the various steps in dispensing, communication, interpretation of the order, and in general, advise the pharmacist as to how to be prepared to meet all dispensing needs. What influence does the formulary system have on dispensing? This presentation can also include the subject of standardization in ward stock preprinted requisitions, etc.

10:55 A.M. Developing a Practical Prepackaging System
Herbert L. Flack, John W. Webb, and Robert C. Bogash (P)
Peter Solyom, Allen V. R. Beck, and Robert C. Bogash (C)

This will be a panel discussion. The participants will describe the method for actually developing a *practical* prepackaging system. The discussion should be directed at the feasibility and adaptability of developing such a system in a small hospital. What sequence should be followed in this development? What precautions should be taken? What are the advantages? Is such a program practical in a small hospital? Illustrative materials should be displayed.

1:30 P.M. Systems for Controls and Safety
John W. Webb (P)
Allen V. R. Beck

This presentation could present the extent of the pharmacist's responsibility throughout the hospital, in a somewhat elementary manner, with particular regard to labeling, checking, nursing errors and confusion, and the pharmacist's overall responsibility. Recently, the American Hospital Association recommended: "to urge . . . that hospital pharmacists to extend their responsibilities to include participation in programs dealing with the safe handling of drugs throughout the hospital." This concept should be impressed on the student's mind.

2:10 P.M. Clinic Session

Thursday, June 19, Philadelphia and Wednesday, July 30, Chicago

Education and Information

Herbert L. Flack, Presiding in Philadelphia
Robert C. Bogash, Presiding in Chicago

9:00 A.M. Educational Programs for Nurses, Medical Interns, and Residents
Sister M. Gonzales (P & C)

The speaker will describe the educational programs which can be conducted by the hospital pharmacist in these specific areas. This presentation should include *what* should be taught to *whom* by what means (formal lectures, group discussions, informal meetings). What responsibilities does the hospital pharmacist have in this area? What are the advantages in conducting these programs? How does one conduct these programs?

9:40 A.M. A Method of Communicating—Pharmacy Newsletter
Louis P. Jeffrey (P)
Paul G. Bjerke (C)

The speaker will describe the newsletter, offering suggestions for preparation, content, format, function, etc. Sample newsletters should be distributed.

10:35 A.M. Pharmacy and Therapeutics Committee—Functions, Organization, and Operation
Joseph A. Oddis, Joseph V. Terenzio, Leo F. Godley, and Sister M. Gonzales (P)
Joseph A. Oddis, Kenneth B. Babcock, Don E. Francke, and Joseph Crisalli (C)

This subject has been covered many times in the past in similar programs and in the literature. However, the recent strong recommendation of the Joint Commission on Accreditation of Hospitals (Bulletin No. 16, JCAH) that hospitals establish

Pharmacy and Therapeutics Committees clearly indicates the need for again presenting the subject as part of the institute program.

The manner of presentation has been revised. The subject will be presented by an illustrator and an expert group of discussants. The illustrator, who will also act as moderator, will introduce the subject giving the historical development of this committee. He will introduce the discussants who will be responsible for developing one of the three aspects—functions, organization, operation. The illustrator will prepare specific questions which will be known to the discussant in advance and which the discussant will attempt to answer in his presentation. By means of cards and a magnetic board, the illustrator will demonstrate the specific points which the discussant is making. This process will be repeated with each presentation.

For example, typical questions which should be answered are:

Functions
1. Specific functions?
2. How are they implemented?
3. What factors may influence the scope of activity of the committee?

Organization
1. How is this committee formed?
2. What authority should it have?
3. Members? Officers? Meetings?

Operation
1. What happens in the first meeting?
2. What happens in the subsequent meetings?
3. Agenda? Conduct of meeting? Time? Place? Length of meeting?

By this visual approach, it is hoped that the main features of a Pharmacy and Therapeutics Committee will be firmly established in the minds of the students.

1:30 P.M. Supervision and On-the-Job Training Program for the Pharmacy Staff

Louis P. Jeffrey (P)
Grover C. Bowles (C)

New employees must be properly oriented and supervised. Old employees must keep abreast of current developments. Both the professional and nonprofessional staffs must have a clear understanding of their respective duties and responsibilities. Some means of achieving this is through indoctrination and orientation programs; clear pharmacy staff organizational lines; job descriptions; continuing in-service training programs, etc. The relative merits of these possibilities should be explored and demonstrated. Sample job descriptions should be distributed.

2:10 P.M. New Drugs: Chemistry, Pharmacology, and Therapeutics

Linwood N. Tice (P)
Theodore Sherrod (C)

This session will be a review of some drugs currently in use. The chemistry, pharmacology, and therapeutics of each drug should be presented. The speaker may choose the individual drugs or classes of drugs to be discussed.

3:05 P.M. Let's Examine the Pharmacy Budget

Herbert L. Flack, Ellsworth R. Browneller, and A. C. Englin, Jr. (P)
Clifton J. Latiolais, Howard F. Cook, and Arthur Hartfelder (C)

Hospitals in recent years have become "big business." As with all big business operations, tools of management must be employed. One of these tools is the budget.

More and more hospital administrators are employing the budget system as a valuable working tool. Department heads are being asked to prepare and live with realistic departmental budgets.

The hospital pharmacist, as a department head and responsible for a significant portion of the hospital dollar, must be prepared to develop and understand the budget system, its advantages and limitations.

This session will be a dramatization of a budget meeting. The participants will include a pharmacist, an administrator, and a controller. Each participant will briefly discuss pertinent points which each should consider in preparing a pharmacy budget and in preparation for a budget session. The pharmacist will prepare a fictitious pharmacy budget for a 300 bed hospital, bearing in mind that the hospital is presently building a new addition and will be operating with 50 additional beds during the last 6 months of the year. He will defend his proposed budget in the meeting substantiating his requests with data, trend figures, workloads, etc. Copies of the fictitious budget should be prepared for distribution to the students.

4:30 P.M. Clinic Session

7:00 P.M. What Is *Your* Problem?

Leo F. Godley, Sister M. Gonzales, J. Robert Cathcart, Joseph V. Terenzio, Clifton Latiolais, and R. David Anderson (P)
Grover C. Bowles, Don E. Francke, Clifton J. Latiolais, Sister Berenice Ripperger, Paul G. Bjerke, and Russell F. Lovell (C)

This will be a question and answer period. Selected faculty members will serve as discussants. The students will be asked to present specific pharmaceutical *problems* as they exist in their respective institutions. The discussants will attempt to analyze the problem and offer suggestions for a solution.

Friday, June 20, Philadelphia and August 1, Chicago

Expansion and Special Services

Leo F. Godley, Presiding in Philadelphia
Winston Durant, Presiding in Chicago

9:00 A.M. Extending Pharmaceutical Service

Robert C. Bogash (P and C)

This session will deal with developing the concept of providing some aspects of pharmaceutical service to any related department concerned with the use of drugs (anesthesia, clinical laboratory, radiology department). What can pharmacy do to assist these other departments? Another extension of service may include participation in the hospital poison control program. What are the pharmacist's responsibilities in such a program? This presentation should also introduce the theme of the following presentation which is still another extension of service.

9:40 A.M. Around-the-Clock Pharmacy Service

Robert C. Bogash, Clifton Latiolais, and Louis P. Jeffrey (P)
Robert C. Bogash, Paul G. Bjerke, and Joseph Crisalli (C)

This presentation should indicate that there is more to "around-the-clock" pharmacy service than establishing an emergency cabinet. There are too many places where the pharmacist does not recognize his responsibility with regard to late admissions, the increasing number of items taken when the pharmacy is closed, the fact that the physicians have all sorts of hours and upset the nursing and pharmacy patterns, etc. Other departments provide around-the-clock service. Should not the pharmacist assume his share of this total responsibility? Is this feasible? Is it practical? Is it economical? How can it be done?

10:30 A.M. How to Introduce and Establish New Services

R. David Anderson (P)
Paul G. Bjerke (C)

Frequently, good motives are misunderstood. New services do not materialize or succeed because the original approach was poor. How do we "sell" the administrator and department heads on a new idea for service? What progressive steps should be taken? How do we break-down custom and tradition when a change is indicated? What are the pit-falls in establishing a new service after it has been approved?

11:10 A.M. Clinic Session Review

Paul F. Parker (P and C)

The institute coordinators and clinic session leaders will hold a clinic session before the student body. The purpose of the review session will be to high-light the areas of discussion in the individual daily sessions. Time permitting, an open discussion will follow.

1:00 P.M. Luncheon

The Pharmacist of the Atomic Age

Joseph B. Sprowls (P)
George L. Webster (C)

The speaker will present a 20 minute dissertation regarding his predictions and forecast for the future. The recent scientific developments undoubtedly will have significant effects on the future practice of pharmacy. What possible changes can we expect?

Presentation of Certificates

Therapeutic Trends

edited by PAUL PARKER

Psychosis And Tremor Due To Mecamylamine

A report in *The Lancet* I:499 (Mar. 8) 1958 suggests that tremor and mental disturbance, with confusion and hallucinations, may be a not uncommon complication of treatment with mecamylamine given in large dosage. The authors believe that such toxicity may more commonly be encountered in patients with severely impaired renal function.

Mecamylamine, which is available as Inversine hydrochloride, has been previously reported to have a toxic action on the central nervous system by Deming in the *New Eng. J. Med. 256*:739, 1957 and by Schneckloth in the *J. Am. Med. Assoc. 162*:868, 1956. The authors describe in detail the clinical aspects of four cases which occurred among 90 patients treated with mecamylamine. The average daily dose of the drug in the whole series was only 35 mg. But, the dosage in those patients exhibiting toxicity was in the range of 60 to 65 mg. daily. In addition to the four cases described in detail, three other patients who were treated with mecamylamine developed a tremor without the mental symptoms. The complications were presumably related to the retention of mecamylamine in the body because its urinary excretion was reduced due to renal failure.

Triiodothyronine

According to Newman and Escamilla in *Calif. Med. 88*:206 (Mar.) 1958, thirty patients with evidence of hypometabolism or a clinically related condition were given triiodothyronine after suboptimal response to thyroxin or desiccated thyroid. DL- and L-isomers of triiodothyronine were used and compared. Thirteen patients (43.3 percent) were improved and 17 (56.6 percent) were unimproved or became worse. Side effects occurred in 9 of 34 trials (26 percent), and could not always be eliminated by decreasing the dosage. The highest percentage of good response occurred in a small group (four of five) who received a combination of desiccated thyroid or thyroxin with supplemental triiodothyronine.

Despite careful analysis of the data, no basis was found on which to predict which patients would receive benefit from the triiodothyronine. However, the occasional improvement, sometimes dramatic, suggested that a therapeutic trial with triiodothyronine in difficult or unresponsive case of hypometabolism or hypothyroidism is justified.

Aspirin Combinations

The following comments were made by Dr. Dale G. Friend in the *New Eng. J. Med 257*:278 (Aug. 8) 1957:

"Combinations of acetylsalicylic acid with other analgesics such as codeine and acetophenetidin are useful and have gained widespread acceptance. It is doubtful, however, whether these combinations really add anything to the value of acetylsalicylic acid, and for the most part it is better to use acetylsalicylic acid to the maximum degree of its benefit and add the other agents as indicated for a supplementary or enhancing effect, depending upon the dose and the patient's response. Combinations of acetylsalicylic acid with acetophenetidin and caffeine or amphetamine have also been found useful. The same criticism applies to these preparations. It is better to use the acetylsalicylic acid alone in the most efficient manner possible and to add any necessary supplementary stiumulation with caffeine or amphetamine as indicated by the patient's needs and responses, rather than to try a multiple preparation that cannot be fitted to the needs of every patient.

"Combinations of acetylsalicylic acid or other salicylates with the steroid compounds such as cortisone, hydrocortisone, and prednisone have recently been released for use in rheumatoid arthritis. The uncritical use of these preparations is fraught with danger. It is better to give the drugs individually in a dose adjusted to the needs of the patient. In this manner one may obtain the maximum benefit from acetylsalicylic acid and depend much less on the steroids. Thus, the possibility of toxic effect from the steroids or gastrointestinal hemorrhage from steroid or acetylsalicylate is reduced. Ready-fixed compounds force the physician into titrating his patients to fit the drug rather than titrating the drug to the needs of the patient."

Glucagon In Insulin Reactions

Glucagon is a simple protein which was first purified and crystallized in 1953, but it has been recognized for many years as the hyperglycemic-glycogenolytic factor of the pancreas which is produced in the Islets of Langerhans. With respect to its role in carbohydrate metabolism, some investigators look upon glucagon as an insulin antagonist while others consider it an insulin synergist.

A group at the Veterans Administration Hospital and School of Medicine at the University of Colorado have reported on various aspects of glucagon during the past few years including its ability to mobilize liver glycogen, increase the peripheral utilization of glucose, and are now reporting on the value of crystalline glucagon in the treatment of insulin reactions. Glucagon has certain advantages over glucose for this purpose, since it makes use of endogenous glucose and is less likely to upset diabetic control in the patient with severe diabetes. It is also easier and more convenient to administer than is intravenous glucose. The authors suggest that it might even be advantageous for outpatient use, since no harmful effects would result from the administration of glucagon to patients with symptomatology mimicking hypoglycemic reactions. The current report was published in the *N. Eng. J. Med. 258*:476 (Mar. 6) 1958.

It is interesting to note that a report from the Department of Psychiatry at Johns Hopkins Hospital in Baltimore and published in the *J. Clin. Investigat. 36*:74 (Jan.) 1957, also describes this usage of glucagon for patients who had received massive doses of insulin such as would be used in the insulin coma treatment of psychiatric patients. The intravenous route of administration was found to be definitely superior to the intramuscular or subcutaneous route in these studies, but the needs were obviously of a different magnitude.

Quinidine Sulfate Toxicity

A recent report published in the *Staff Meetings of the Mayo Clinic 33*:87 (Feb. 19) 1958 cites four cases in which purpuric manifestations developed as an apparent consequence of idiosyncracy to quinidine sulfate. According to the study, these four cases and the growing number of cases reported in literature suggests the incidence of thrombocytopenic purpura related to quinidine therapy is much higher than once thought. The onset of symptoms may be gradual or sudden and anaphylactoid in nature. Findings are those of acute thrombocytopenic purpura. The authors note that a clinical diagnosis requires a high index of suspicion, and point out several indications that might confirm a diagnosis. Although not necessarily related to the total dose, symptoms persist and become more severe when quinidine therapy is continued. When quinidine therapy is discontinued, the prognosis for recovery is good.

Antihistamines For Transfusions

In a controlled study at the Middlesex Hospital in London with 200 blood transfusions it was indicated that there was no justification for the routine prophylactic use of antihistamines to prevent pyrogenic reactions. The study was published in *The Lancet 1*:497 (Mar. 8) 1958.

The overall incidence of pyrogenic reactions in the study was 35 percent as compared with the usual incidence of 3 to 6 percent. The higher incidence of reactions was thought to be due to the methods of observation used. The investigator used 10 mg. of chlorpheniramine maleate (available in the United States under the name Chlor-Trimeton) in each bottle of blood.

It was pointed out that the conclusions of the study did not apply to patients with a known history of allergy.

I.V. Fructose Causes Hyperpyruvaturia

A study reported in *The Lancet 1*:506 (Mar. 8) 1958 indicates that intravenously infused fructose increases the renal excretion of pyruvate, whereas glucose does not do this. The increased renal excretion is thought to be mainly due to depression of the tubular reabsorption of pyruvate. In most cases the increased excretion ceased within an hour after the administration of the fructose.

It was difficult to explain the phenomenon because the mechanism of renal excretion of pyruvate was unknown. It was attributable either to the increase in quantity of pyruvate filtered or to depression of its tubular reabsorption. It was thought that the average increase in pyruvate filtered could not by itself produce the hyperpyruvaturia observed, and there was hyperpyruvaturia in cases where the pyruvate filtered decreased.

The authors previously showed that intravenous administration of fructose brings about a greater increase in urinary inorganic phosphorus than the administration of glucose. The full importance of these studies has not been determined.

Resistance And Sensitivity To Digitalis

There is great variability in the amount of digitalis necessary for optimum effect in different individuals. In a considerable group of patients unusual resistance or marked sensitivity may occur according to Craig and Levine in the *J. Am. Med. Assoc. 166*:2139 (April. 26) 1958. The two most important factors which determine the responsiveness to digitalis are the state of the heart muscle and the electrolyte balance in the body. With increasing severity of cardiac decompensation, smaller doses of digitalis will produce intoxication. When body potassium is depleted, enhanced sensitivity to digitalis results. The operation of these two factors may be the common underlying basis for sensitivity as well as resistance to digitalis under all circumstances. Awareness of these principles may at times prevent severe digitalis intoxication and even fatality.

Timely Drugs

Cothera

CHEMICAL NAME: Dimethoxanate hydrochloride.

INDICATIONS: Nonnarcotic, nonaddictive antitussive, specific for control of useless and/or harmful cough.

DOSAGE: Adults—25 to 50 mg. 3 or 4 times daily; children 2 to 8 years—12.5 to 25 mg. 3 or 4 times daily.

PREPARATIONS: Cherry-flavored syrup containing 25 mg. dimethoxanate hydrochloride per 5 ml.

PACKAGING: Bottles of 16 oz.

SUPPLIER: Ayerst Laboratories.

Elixophyllin

COMPOSITION: Theophylline.

INDICATIONS: Vasodilator; anti-asthmatic.

DOSAGE: Adults—4 or 5 tablespoonfuls for rapid relief of asthma attack, 1 or 2 tablespoonfuls 3 times daily for prevention of attacks.

PREPARATIONS: Elixir containing in each 15 ml.: theophylline 80 mg. (equivalent to 100 mg. aminophylline) and alcohol 3 ml.

PACKAGING: Bottles of 16 oz.

SUPPLIER: Sherman Laboratories.

Isuprel-Franol

COMPOSITION: Outer layer of isoproterenol (Isuprel) hydrochloride and inner core containing phenobarbital, benzylephedrine hydrochloride, and theophylline (Franol).

INDICATIONS: Bronchial asthma.

SIDE EFFECTS AND CONTRAINDICATIONS: Should not be administered concomitantly with epinephrine; overdosage may result in tachycardia, palpitation, nausea, headache.

DOSAGE: Therapeutic—1 tablet under the tongue; Prophylactic—1 tablet 3 or 4 times daily, swallowed whole.

PREPARATIONS: Tablets containing either 5 mg. (mild) or 10 mg. (regular) isoproterenol hydrochloride, with inner core containing phenobarbital 8 mg., benzylephedrine 32 mg. and theophylline 130 mg.

PACKAGING: Bottles of 100 tablets.

SUPPLIER: Winthrop Laboratories.

Meperidine Hydrochloride Tubex

INDICATIONS: Analgesic.

CONTRAINDICATIONS: Narcotic, liable to addiction.

DOSAGE: 50 to 100 mg. intramuscularly.

PREPARATIONS: Injection, 50 mg., 75 mg., and 100 mg. per ml.; 1 ml. Tubex.

SUPPLIER: Wyeth.

Magnocyl

COMPOSITION: Polymer of ethylene oxide and propylene oxide.

INDICATIONS: To relieve, and thereafter prevent, fecal dehydration in pregnancy and diverticulitis; also in constipation associated with iron therapy, barium mixture, colon obstruction, spastic colon, and anal-rectal diseases.

DOSAGE: Adults—1 capsule 3 times daily; infants—only as directed by physician.

PREPARATIONS: Capsules of 0.25 Gm.

PACKAGING: Bottles of 28 and 100 capsules.

SUPPLIER: Paul B. Elder Co.

Trilafon Injection

GENERIC AND CHEMICAL NAMES: Perphenazine; 1-(2-hydroxyethyl-4-[3-(2-chloro-10-phenothiazinyl)-propyl]-piperazine.

INDICATIONS: Tranquilizing and antiemetic drug; to control severe vomiting, intractable hiccoughs, or acute symptoms such as violent retching during surgery.

SIDE EFFECTS AND CONTRAINDICATIONS: Should not be given to patients in coma or severely depressed states; may obscure diagnosis of such conditions as brain tumor, drug intoxication, intestinal obstruction; as with other phenothiazines, caution should be used when administering these drugs to patients with coronary disease or severe hypertension.

DOSAGE: Intravenously in hospitalized patients in doses not exceeding 5 mg, by slow drip infusion.

PREPARATIONS: Injection containing perphenazine 5 mg., sodium biphosphate 20 mg., exsiccated sodium phosphate 1.5 mg., sodium bisulfite 1 mg., exsiccated sodium sulfite 1 mg., water for injection, to make 1 ml.

PACKAGING: 1 ml. ampuls in boxes of 6 and 100.

SUPPLIER: Schering Corp.

Trilafon Syrup

GENERIC AND CHEMICAL NAMES: Perphenazine; 1-(2-hydroxyethyl-4-[3-(2-chloro-10-phenothiazinyl)-propyl]-piperazine.

INDICATIONS: Antiemetic and tranquilizer.

CONTRAINDICATIONS: Leukopenia and other evidences of bone marrow depression; in depressed conditions whether psychic in origin or induced by depressant drugs; any unexplained and significant rise in body temperature may indicate individual intolerance.

DOSAGE: Children 1 to 6 years—5 ml. 2 or 3 times daily; 6 to 12 years—5 ml. 3 or 4 times daily; over 12 years—lowest range of adult dosage, individually determined.

PREPARATIONS: Syrup containing 2 mg. per 5 ml.

PACKAGING: 4 oz. bottles.

SUPPLIER: Schering Corp.

Wyanoids HC

COMPOSITION: Hydrocortisone, belladonna extract, ephedrine sulfate, zinc oxide, boric acid, bismuth oxyiodide, bismuth subcarbonate, and balsam peru.

INDICATIONS: In treatment of acute and chronic nonspecific proctitis, radiation proctitis, internal anal pruritus, etc.

DOSAGE: 1 suppository twice daily for 6 days or as required.

PREPARATIONS: Suppositories containing hydrocortisone 10 mg., belladonna extract 0.5 percent, ephedrine sulfate 0.1 percent, and other ingredients.

PACKAGING: Boxes of 12 suppositories.

SUPPLIER: Wyeth.

Consulting WITH BOWLES

GROVER C. BOWLES JR., *Baptist Memorial Hospital, Memphis, Tennessee*

► How do the disinfectant properties of ethyl alcohol compare with those of isopropyl alcohol?

The following information is quoted from the book "Principles and Methods of Sterilization" by John J. Perkins and published by Charles C. Thomas, Springfield, Illinois.

"Ethyl alcohol is widely used as a skin antiseptic. It possesses valuable wetting properties and is a fairly good fat solvent. The optimal germicidal concentration is usually given as 70 percent by weight (81 per cent by volume), although Morton's findings indicate that it has a high degree of germicidal activity in the range 50 to 95 per cent. When properly used it will destroy vegetative organisms but is ineffective against spores. Because of its protein-coagulating action instruments must be thoroughly cleansed before contact. Its usefulness as a disinfectant for articles contaminated with acid-fast organisms-tubercle bacilli has not been well defined. Isopropyl alcohol is rapidly displacing ethyl alcohol for many uses. It exhibits slightly greater germicidal action, is a better fat solvent and has a lower surface tension. In a 50 per cent solution it is an effective germicide against non-sporulating bacteria. The degerming action is optimal when solutions of 70 per cent (by weight) and stronger are used. Price has stated that "isopropyl alcohol might well be substituted for ethyl alcohol to prepare the skin of the field of operation, but it is not recommended for repeated washing of the operator's hands."

► What methods may be used in controlling stock levels of drugs having wide variations in usage rates?

Adequate purchase records eliminate much of the guesswork in the purchase of pharmaceuticals.

One commonly used system is to maintain a purchase record card for each item purchased. This card gives the date of purchase, purchase order number, quantity purchased, vendor, date received, quantity received, unit price, and the freight charges. Review of the card for the item to be purchased reveals previous cost and usage rates and it becomes a simple matter to determine the quantity needed for a given period.

Another highly successful system that aids in maintaining proper stock levels with maximum turnover is the purchase inventory record. When this system is used, the inventory is usually arranged by suppliers. An inventory card listing all items purchased from a supplier with space provided for the name of the item, the amount on hand, amount ordered, date of order, purchase order number and date the order is received, is maintained. A complete inventory of all items listed on the inventory card is taken at weekly, bi-weekly or monthly intervals. The quantity ordered is determined by the quantity used since the last purchase was made. Sample forms used in this system are available from the Editor of this Column without charge.

► What is the proper method of sterilizing hypodermic needles to prevent the transmission of infectious hepatitis?

The Journal of the American Medical Association, Vol. 165, No. 14, in response to a similar question, "Is boiling of needles for 10 minutes sufficient for the prevention of transmission of infectious hepatitis?", gave the following answer:

"There is no evidence to substantiate that boiling needles and syringes for 10 minutes in water will destroy the virus of infectious hepatitis or of homologous serum hepatitis. Autoclaving for 10 to 15 minutes at 121° C. (250° F.) or sterilizing in a hot air oven at 165° C. (329° F.) for one hour is a far more reliable procedure. Prior to any sterilization procedure, residual blood and tissue should be eliminated by thorough mechanical cleansing of needles and syringes. In lieu of an autoclave, a pressure cooker containing water can easily be adapted as a sterilizer and used on a hot plate. A temperature of 115° C. (240° F.) will be attained by a pressure of 10 lb. per square inch (at sea level). A 30-minute cycle at that temperature will effect sterility. If lower pressures and temperatures are employed, the time interval must be increased."

► Does a pharmacist have a **legal** right to insist on the sole responsibility for labels on items stocked at nursing stations and that labels be changed only by a member of the pharmacy staff?

This question was referred to Dr. George F. Archambault who, in addition to being a past president of the SOCIETY, is also a member of the Massachusetts Bar.

Dr. Archambault has given us an informal opinion on this question which can be summarized as follows: "As of the moment, I do not feel that the pharmacist has a *legal* right to insist on the *sole responsibility* for labels on items stocked at nursing stations. But he does have a *professional prerogative* to insist that this practice be adopted as a hospital policy. Certainly, if he is to have the sole responsibility, he must insist on this right or operate at his own professional peril. In other words, he cannot rightfully assume this responsibility unless he alone has the authority to label, or to approve the labeling, of all items stocked at nursing stations."

SELECTED PHARMACEUTICAL ABSTRACTS

and summaries of other articles interesting to hospital pharmacists

. . . . . .

edited by CLIFTON J. LATIOLAIS *and* LEO F. GODLEY

SURFACTANTS, CHEMISTRY AND PHYSICAL PROPERTIES OF NONIONIC

Nonionic Surface Active Agents I. Chemistry and Manufacture, Raphael, L., Manufacturing Chemist 29:105 (Mar.) 1958.

Commercially available nonionic surface active agents are of two types, (1) long-chain fatty acid esters derived from ethylene oxide or polyhydric alcohols such as glycols, polyglycols, glycerol, sorbitol, or sucrose and (2) ethers of long-chain fatty alcohols, alkylated phenols or mercaptans prepared by direct reaction with ethylene oxide. The author discusses the relationship existing between the chemistry and physical properties of these agents. Particular attention is given to the second group.

The ethers prepared by direct reaction with ethylene oxide are typified by the following reaction: fatty alcohol (R-OH) plus ethylene oxide (CH_2CH_2O) yielding monoglycol ether (R-O-CH_2CH_2OH). The CH_2CH_2O chain will continue to increase in size as long as ethylene oxide is fed into the system.

The resultant variations in ethylene oxide chain length in turn determine, to a great extent, the physical properties of the surface active agent. Properties discussed are solubility, emulsifying properties, melting point, cloud-point, foaming characteristics, and wetting or surface tension lowering properties. In general, solubility increases as more and more CH_2CH_2O is condensed on to the fatty alcohol. Products with low (5-10 moles) CH_2CH_2O content are oil soluble and water dispersible. These make good water-in-oil emulsifiers. With high (18-30 moles) CH_2CH_2O content, hydrophilic properties predominate and oil-in-water emulsions result. Melting point drops with condensation with CH_2CH_2O until a balance between hydrophilic and hydrophobic groups exists. Further, condensation raises the melting point until strongly hydrophilic viscous liquids and pastes are formed. Cloud-point, the specific temperature at which solutions of nonionics become cloudy, is a phenomenon of inverse solubility at higher temperatures. As the CH_2CH_2O content of a nonionic increases the solubility increases. Also, the cloud-point then rises. The foaming power of nonionics is poor, especially in hard water. This does not affect their emulsifying or cleansing properties. The shorter the CH_2CH_2O chains, the greater the wetting properties of nonionics. Also, as temperature rises, wetting increases, although above the cloud-point the nonionic will have no effect as it is then out of solution.

JOHN D. LUCASSE

MARKETING DRUGS

Determining the Market for New Pharmaceuticals, Setterstrom, C., Drug and Cos. Ind. 82:177 (Feb.) 1958.

The author briefly presents the guide posts that he uses to determine the market for new pharmaceutical products. Top management of the pharmaceutical industry is constantly called upon to decide a course of action when confronted with factors such as: (1) conflict in clinical data and interpretive opinions; (2) need for long-range study to insure drug safety when confronted with the need for making the new agent available as soon as possible; (3) desire of being first with a new agent as opposed by the importance of waiting for research to develop a more effective or less toxic related compound; (4) initiating all-out crash programs to exploit a major research break-through and maintaining uninterrupted and sustained research directed to major objectives; (5) the possibility of overloading physician and pharmacist with more than enough dosage forms and a realization of the possibility that an astute competitor may come out with a dosage form affording a minor advantage and be in command of the market; and (6) resolving the fact that a good profit may be made; however, new and expensive manufacturing facilities may soon be obsolete.

In order to make these decisions with greater facility, Mr. Setterstrom points out that his company [Charles Pfizer and Company] calls on several professions or skills for assistance. Doctors of medicine are called upon to supplement the data of chemists, pharmacologists and others as well as sales personnel to determine the nature of dosage formulation research.

Statistics are utilized to determine a true picture of chemical, biochemical, clinical, and sales data. Pharmacists and chemical engineers, supported by legal advisers, are called upon to coordinate and expedite the introduction of new products. Competitive activities, evaluation of market potential, and determination of market by test, all assist in determining the possible market requirement.

Men in research, operations and commercial development help to formulate long-range new product planning. Finally, Mr. Setterstrom states that salesmen are important in the advertising and sale of a new pharmaceutical product.

EDWARD A. SUPERSTINE

ASPIRIN AND BUFFERED ASPIRIN

Aspirin and Buffered Aspirin, Kalish, Joseph, Drug and Cos. Ind. 82:304 (Mar.) 1958.

Two articles and one editorial recently appeared in *The New England Journal of Medicine* (Jan. 30, 1958) which indicate that there is no particular advantage to using buffered acetylsalicylic acid. This article by Dr. Kalish is a review and commentary on the aforementioned reports.

The author points out that there is conflict in the two articles when one is compared statistically to the other and states that the differences are large enough to permit the entering wedge of doubt as to the overall validity of these studies. The articles show a 15 to 20 percent difference in reported gastrointestinal reactions.

Kalish further comments that the blood salicylate levels that were reported do not allow for the wide individual variations in salicylate levels, and overlapping of ranges in all the time intervals is quite large. The comparable data of the two authors are in agreement; however, Dr. Kalish points out that earlier work (*J. Am. Pharm. Assoc., Sci. Ed. 39*:21, 1950) illustrates that blood salicylate levels with buffered aspirin were almost twice as high as with plain acetylsalicylic acid, rather than about equal as reported in *The New England Journal of Medicine*. In his final remarks, Kalish writes that the double blind technique, employed by the researchers, may not be too valid and casts doubt on findings, in either direction, concerning the merits of buffered *vs.* unbuffered acetylsalicylic acid. The author continues and states that the analytical data presented for blood level studies are somewhat equivocal.

EDWARD A. SUPERSTINE

SUSTAINED RELEASE MEDICATIONS, FOMULATION OF

The Formulation and Evaluation of Sustained Release Products, Blythe, R. H., Drug Standards 26:1 (Jan.-Feb.) 1958.

Sustained release preparations are designed to provide the required amount of a drug needed to produce a desired therapeutic effect immediately, and to make the balance available at a rate which will maintain the therapeutic activity for the period claimed. Whether

or not a drug is suited for incorporation into a sustained release formulation depends upon such factors as its metabolism, the site of absorption, and the manner in which it is excreted (metabolized or excreted unchanged). Drugs that are not satisfactorily absorbed in the lower part of the intestinal tract, and drugs that require too large a daily dose to be taken at one time are among those that are not suitable for eliciting such an effect. Because no one drug is exactly like another, each sustained release preparation must be individually tailored to the physical and biologic properties of that drug.

The investigator must determine such factors as the minimal therapeutic dose of the plain drug, the maximum dose that can be given without producing undesirable side effects, and the optimal dose that can be given. He must also determine the time needed to produce its peak effect, and how long any given dose will be effective. Then comes the problem of formulating the drug into a preparation that will yield the preconceived release pattern. Factors such as pH, electrolyte concentration, surface tension, temperature are all vital.

Several dosage forms are currently available and have varying mechanisms of action. Sustained release action is obtained in capsules by incorporating the medicament in hundreds of minute pellets, some coated and others uncoated. The uncoated pellets release enough of the drug initially to provide a rapid therapeutic response; the rest of the pellets are coated with varying thicknesses of a suitable material which will gradually release amounts of the drug necessary to prolong the response. Tablets are prepared by mixing several granulations; one quickly soluble and the others slowly disintegrating, each of which contains differing amounts of a retarding agent. These portions are then combined in layers or compressed around a slowly disintegrating core. There are also sustained release liquids available that are prepared by dispersing very fine microscopic particles of the drug throughout slightly larger microscopic particles of a slowly disintegrating matrix; the resulting pellets are then suspended in a viscous aqueous vehicle.

Other methods of preparing sustained release preparations are by forming a drug complex whose physiologically active portion will be gradually released by hydrolysis in the gastrointestinal tract, or by combining the drug with an ion exchange resin, the drug being gradually eluted from the resin as it passes through the gastrointestinal tract.

It has been extremely difficult to devise standard methods and specifications which will apply to all sustained release preparations due to the vast differences in the properties of the drugs concerned. At present, both *in vitro* and *in vivo* tests are carried out, but the *in vitro* tests, such as time required for the disintegration of the formulation in simulated intestinal and gastric fluids, are of no value unless the release rates correlate with the results of *in vivo* studies. The final criterion for judging the value of sustained release preparations is their clinical effectiveness.

ROBERT L. RAVIN

TABLET COATING WITH POLYVINYLPYRROLIDONE

A Study of Tablet Coating Using Polyvinylpyrrolidone and Acetylated Monoglyceride, Ahsan, S. S. and Blaug, S. M., Drug Standards 26:29 (Jan.-Feb.) 1958.

Sugar coating of tablets by conventional means is a very slow and tedious process requiring great skill and experience. A process has now been developed for tablet coating which requires little skill and can be accomplished quite rapidly.

The coating is produced by using a combination of 5% polyvinylpyrrolidone (a type of plastic), 5% acetylated monoglyceride, and 2% polyethylene glycol 600, in 70% ethanol. The coatings produced are uniform, smooth and durable, and disintegrate almost as rapidly as uncoated tablets. Also, the coatings are stable in humid atmosphere. Further advantages are that the film coating materials are noncaloric, non-toxic, and readily available. Furthermore, the process provides a sugar-free coating for those on sugar restricted diets.

ROBERT L. RAVIN

MENADIONE INJECTION, STABILITY OF

Stability of Menadione Sodium Bisulfite Injection, Yeh Shu-Yuan, and Weise, Gail A., Drug Standards 26:22 (Jan.-Feb.) 1958.

The synthesis of menadione sodium bisulfite was heralded in the realms of medicine and pharmacy since it provided the same degree of activity as menadione and also had the outstanding advantage of being water-soluble. However, the bisulfite injection is affected by light, heat, and pH. Therefore, investigation was carried on to determine under what conditions menadione sodium bisulfite injection would be most stable and to establish the formulation and packaging necessary to increase its shelf life.

It was found that a higher concentration of sodium bisulfite, up to 0.2% (50% of the quantity of menadione sodium bisulfite) is needed to prevent the loss of the sodium bisulfite group, which causes the development of a yellow color and the formation of a precipitate. It was also found that the injection is more stable when prepared in a fresh solution of isotonic sodium chloride or in solutions below pH 2.5. The use of isotonic saline is advantageous since a solution made with it will cause less discomfort to the patient upon parenteral administration.

It was also found that the use of inert gases, such as nitrogen, carbon dioxide and sulfur dioxide, which are generally used as antioxidants, promote the conversion rate of the sodium bisulfite salt to a compound possessing less than one-tenth of the antihemorrhagic activity of the menadione sodium bisulfite.

Menadione sodium bisulfite is rapidly decomposed by heat and light; however, using bacterial filtration, packing in individual cartons and storing in a cool place will lengthen the shelf life.

A formulation of the injection has been developed which will have an estimated shelf life of 2½ years at 20° C., 2 years at 25° C. and 1½ years at 30° C. The following formula was thought to be the best one.

Menadione sodium bisulfite, hydrous	0.47824	Gm.
Sodium bisulfite	0.2	Gm.
Sodium chloride	0.7	Gm.
Distilled water, to make	100.0	ml.

ROBERT L. RAVIN

ANTIPHLOGISTIC EFFECT OF ERIGERON CANADENSIS L.

Erigeron Canadensis L. and Its Antiphlogistic Effect, Lenfeld, J. and Kabelik, J., Ceskoslovenska Farmacie (Czechoslovakia) 7, 1:20, 1958..

The effect of an alcoholic extract of the dried herb *Erigeron canadensis L.* on edema of rats was investigated. The edema had been produced artificially by the subcutaneous injection of formaldehyde. Sixty-four percent of the rats were cured by the extract. It was also found that the effective substances are soluble in alcohol and water but insoluble in ether. The authors, therefore, conclude that the effective substances are of some other character than that of volatile oils as may be assumed. In the opinion of the authors, *Erigeron canadensis L.* may provide valuable help to the therapy of many diseases.

HUBERT ZACEK

SMOKING AND DEATH RATES

Smoking and Death Rates—Report on Forty-Four Months of Follow-Up of 187,783 Men, II. Death Rates By Cause, Hammond, E. C. and Horn, D., J. Am. Med. Assoc. 166:1294 (Mar. 15) 1958.

The death rates from specific causes have been studied in relation to smoking habits in a group of 187,783 men between the ages of 50 and 69. During the period of the study 11,870 of these men died. For microscopically proved cases of cancer as well as for the total cases reported as cancer it was found that the death rates were higher among regular cigarette smokers than among men who never smoked, that the mortality ratio increased with the number of cigarettes smoked per day, and that the death rates were higher among pipe and cigar smokers than among men who never smoked. A total of 7,316 deaths occurred among regular cigarette smokers, an excess of 2,665 over the 4,651 that would have occurred had the age-specific death rates for smokers been equal to that for nonsmokers. Coronary disease accounted for 52.1% of the excess; lung cancer accounted for 13.5% and cancer of other sites likewise for 13.5%. An extremely high association between cigarette smoking and death rates for men with lung cancer was found in rural areas as well as in large cities. The most important finding of this study was the high degree of association between cigarette smoking and the total death rate.

AUTHORS' SUMMARY

EMULSIFIERS, A SYSTEM FOR CHOOSING

The Hydrophile-Lipophile Balance of Gums, Chun, A. H. C., Joslin, R. S., and Martin, A. N., Drug and Cos. Ind., Part I, 82:164 (Feb.) 1958, Part II, 82:312 (Mar.)1958.

A study was undertaken to determine the hydrophile-lipophile balance of several natural emulsifiers. The article relates the experiences encountered by the researchers in arriving at their conclusions and describes their experimental procedure and the values that were found for several naturally occurring emulsifiers based upon techniques using synthetic emulsifiers of known HLB values

The number of synthetic surface active agents presently available is over 1,000. A selection of the best agent for a particular job is difficult. To select a combination of synthetics is even more difficult. This need was partially fulfilled by Griffin, who in 1948 first advanced a systematic classification of surfactants based on the principal of hydrophile-lipophile balance.

The HLB system is based upon the fact that molecules of surfactants contain two portions, a lipophilic or nonpolar group and a hydrophilic or polar group. The relationship of these two groups is designated as hydrophile-lipophile balance. The third group in an emulsion system is termed the emulsifying agent which is utilized to reduce the interfacial tension between the oil and water phase and to provide for stability. When a stable emulsion is formed, the surfactant acting as an emulsifier is said to have the proper hydrophile-lipophile balance.

If, on the other hand, the molecule of the surfactant is predominantly lipophilic, the agent tends to be more soluble in the oil phase and may migrate completely into the oil. If the molecule is mainly hydrophilic, the agent is taken up by the aqueous phase. In either of these two cases, there is not a suitable balance between hydrophilic and lipophilic groups.

Under Griffin's system of classification, low HLB numbers have been assigned to agents that are mainly lipophilic and high values to those that are hydrophilic. The strength of the lipophilic and the hydrophilic group of a particular surfactant determines its suitability as an anti-foam agent, a wetting agent, a detergent or an o/w or w/o emulsifying agent. The range of HLB values is set up in such a fashion that numbers of about 3 to 8 promote stable w/o emulsions while values of 8 to 16 make for better o/w emulsions.

Required HLB values have been established for emulsifiable materials. Liquid petrolatum has a required HLB value of 10.5 for the production of an o/w emulsion and an HLB value of 4.3 for a w/o emulsion. A mixture of emulsifiers is blended to match the required values to obtain a stable emulsion of the type desired. Griffin has reported the HLB values of some emulsifiers and the required HLB values for many emulsifiable materials.

The chemical nature of a material as well as the electrical charge influences the effectiveness of an emulsifier. After determining the HLB value and chemical type, a determination of the total amount of emulsifier to produce the desired emulsion must be made.

To determine the HLB values for natural emulsifiers, the authors prepared emulsions of each agent in conjunction with a synthetic surfactant of known HLB and an oil of which the required HLB was known. The total concentration of emulsifiers was constant for a given series of emulsions, while the ratio of natural emulsifiers to surfactant of known HLB was varied to produce emulsions of different HLB values.

A total emulsifier content of 0.5% was employed in all except the acacia emulsions, in which case it was necessary to use a total of 3% to obtain a satisfactory product.

When the optimum ratio of natural emulsifier to synthetic agent had been determined, the HLB of the natural emulsifier was determined using a modification of the formula proposed by Griffin.

$$HLB = \frac{R-(H \times S)}{N}$$

where HLB is the calculated HLB of the natural emulsifier, R is the "required HLB" of the oil, H is the HLB of the surfactant (Tween or Span), S is the weight percentage concentration of the surfactant in the total emulsifier expressed as a decimal fraction, and N is the weight percentage concentration of the natural emulsifier expressed as a decimal fraction.

The best mineral oil emulsion employing acacia and Tween 20 was produced when 67.5% of the total emulsifier content was acacia and 32.5% was Tween 20. Tween 20 has an HLB value of 16.7 while mineral oil has a "required HLB" of 10.5 for an o/w emulsion. Using the equation:

$$\frac{HLB=10.5 - (16.7 \times 0.325)}{0.675} = 7.5$$

The HLB of acacia was determined as 7.5 (later reported as 8).

The HLB values of some other natural emulsifiers were: Pharmagel B, 9.8; Methocel, 15 cps, 10.5; and tragacanth, 13.2.

The authors' results indicated that the older concept of antagonism between agents of the "opposite type" should be replaced by the newer concept of hydrophile-lipophile balance. It is, therefore, true that a combination of both acacia and tragacanth can form a better emulsion than either agent alone. Using HLB values and requirements it is possible to predict the best combination of emulsifying agents for a stable emulsion and to select the best surfactant.

EDWARD A. SUPERSTINE

RATE OF DRUG ABSORPTION FROM SUPPOSITORIES

The Kinetics of Rectal Absorption, I. Preliminary Investigations into the Absorption Rate Process; II. The Absorption of Anions; III. The Absorption of Undissociated Molecules, Rigelman, Sidney, and Crowell, W. J., J. Am. Pharm. Assoc., Sci. Ed., 47: 115, 123, 127 (Feb.) 1958.

The reported studies were conducted for the purpose of obtaining more reliable information as to the true nature of the rectal absorption of various types of drug materials from suppository vehicles. Experiments were conducted to determine the effect upon rate of drug absorption of such factors as nature of the suppository vehicle, molecular form of the drug, presence of various concentrations of surface active agents, and particle size of the drug.

A radiological procedure, which measures the absorption rate of radioisotope labeled compounds at the site of rectal absorption, is described in detail. The method provides for direct and continuous detection of the rate of drug absorption in the intact animal and, therefore, yields a more valid picture of the absorption process than can be obtained using the more common indirect procedures.

The experimental drugs used were radioiodide I^{131} labeled sodium iodide, iodoform, triiodophenol, and its sodium salt.

For the absorption of anions, results showed that surfactants accelerate the absorption rate of sodium iodide but retard absorption rate of the phenolate compound. Some of the plausible reasons for this behavior are discussed.

For the absorption of undissociated molecules, the results indicated that the drugs are best absorbed from true solutions in water or from water suspensions of the drug. Surface active agents and polyoxyethylene polymers retard the rate of absorption. The absorption of the drug was retarded as its particle size increased. When the undissociated drugs were dissolved in solid polyethylene glycol and oleaginous bases, absorption times were greatly prolonged.

WARREN E. MCCONNELL

VITAMINS, SOLUBILIZATION OF FAT-SOLUBLE

Solubilization of Fat-Soluble Vitamins with Sucrose Monoesters of Fatty Acids, Mima, H., Pharm. Bull. (Japan) 5:496 (Oct.) 1957.

The solubilization of fat-soluble vitamins in aqueous media can be accomplished with nonionic surfactants. However, these are often unfit for oral use or produce solutions which cloud easily upon warming. The author has investigated the use of glucose monoesters as fat-soluble vitamin solubilizers. They were found to be satisfactory, giving a clear, stable solution. Oral toxicity is very low since decomposition yields only sucrose and a fatty acid. Injection of these esters may be dangerous; however, as esters are generally hemolytic.

Following is a table giving minimum amounts of the various esters of glucose needed for solubilization of some common fat-soluble vitamins. The parts of ester given in the table when mixed with one part of vitamin and then 200 parts of water will give a clear solution.

Vitamin	Caprylate	Caprate	Laurate	Myristate	Palmitate	Linolenate
A palmitate	730	—	720	720	720	24
A acetate	20	6	12	20	20	—
A alcohol	10	8	10	13	20	—
D_2	8	8	10	14	20	—
E acetate	—	10	8	14	20	—

JOHN D. LUCASSE

HERBAL MEDICINES

Herbal Medicines and Disease, Schoental, R., J. Trop. Pediatrics 2:4 208-13 (Mar.) 1957.

It is suggested that the extensive use of medicinal herbs in the tropics and sub-tropics may have a bearing in the incidence of some diseases peculiar to these regions. In particular, such diseases as Kwashiorkor, liver cirrhosis and primary liver tumors, in which the liver is primarily involved, may be related to the ingestion of plants, such as those containing pyrrolizidine (Senecio) alkaloids. Various liver lesions, including fatty infiltration, fibrosis, hyperplasia and neoplasia have been observed in experimental animals as a result of treatment with these alkaloids, administered many months before the onset of illness. This article includes 36 references.

J. S. PALMGREN

PEDIATRIC DERMATOLOGY

Pediatric Dermatology, Perlman, H. Harris and Falk, Alfred B., Report of a Round Table Discussion, prepared by R. D. Gauchat, Pediatrics 21:3 502-7 (Mar.) 1958.

This presentation of the etiology and treatment of ten significant pediatric dermatologic problems placed emphasis on the hazards of overtreatment by enthusiastic "physicians and friendly neighbors." "Indeed, 40% of the dermatosis seen by dermatologists today are due to the effects of overly enthusiastic topical therapy."

All of the eight formulations described were the prescriptions of Dr. Perlman, an empiricist. Dr. Falk, a nihilist, "prefers treatments which employes agents frequently found in the family's kitchen" e.g. simple wet dressings, Spry, starch, etc. Both advised caution in using steroids and liberal, but judicious use of topical antibiotics (excluding penicillin as to sensitizing). Article contains formulation and directions for "Rosen's Emulsion."

J. S. PALMGREN

ATROPINE SULFATE SOLUTIONS, EFFECT OF HYDROLYSIS

Periodical Change of Atropine Sulfate Solution, Takagi, K., Fukuda, H., and Kishi, T., J. Pharm. Soc. Japan 77:497 (May) 1957.

The aqueous solution of atropine sulfate does not indicate lowering of mydriatic action even if its action on isolated intestines is lowered. This fact was re-examined by mydriatic action in mice and the fact was confirmed. A mixed solution of atropine, tropine, and tropic acid shows only the mydriatic action of atropine present. Therefore, if aqueous solution of atropine sulfate has undergone partial hydrolysis, the mydriatic action of such a solution should be lowered by that much. On the other hand, the absence of tropine in the aqueous solution, whose antiacetylcholine action on isolated intestines is thought to have lowered already, was found by paper chromatography, i.e. hydrolysis had hardly taken place.

AUTHORS' SUMMARY

MORPHINE ASSAY

Pharmaceutical Analysis by Polarography. (XVI). Assay of Morphine Using Ion Exchanger Method, Matsumoto, Kazuo, J. Pharm. Soc. Japan 77:367 (Apr.) 1957.

Separation of morphine for its determination in opium preparations by polarography was re-examined since the earlier process of its extraction was not satisfactory from the point of expense and procedures. It was thereby found that separation by ion-exchange resin was a good process. Using the strongly basic anion exchange resin, Amberlite IRA-411, and with N hydrochloric acid as the eluant, morphine was determined in opium alkaloid, hydrochloride injection, opium extract, opium tincture, and opium powder.

AUTHOR'S SUMMARY

TAR-STEROID CREAM, EFFECTIVENESS OF

Three-Way Therapeutic Effectiveness of Tar-Steroid Cream, Welsh, A. L. and Ede, M., J. Am. Med. Assoc. 166:158 (Jan. 11) 1958.

A clinical study of a tar-steroid cream (Tarcortin) demonstrated a three-way effectiveness (antipruritic, anti-eczematic, and anti-inflammatory) on certain selected dermatoses. The patients responded more favorably to the tar-steroid combination than either the alcoholic extract of crude coal tar in a cream base or hydrocortisone alone. Moreover, the tar-steroid cream achieved prompt remission of the acute phases of the dermatoses until appropriate coal tar therapy alone could be applied.

Tarcortin is 0.5% refined alcoholic extract of crude coal tar, lanolin, menthol, and 0.5% hydrocortisone free-alcohol in a nongreasy vanishing cream.

NORMAN HO

GLUCOSE SOLUTIONS, STABILITY OF PARENTERAL

A Study of the Decomposition of Glucose Solutions, Webb, N. E., Sperandio, G. J., and Martin, A. N., J. Am. Pharm. Assoc., Sci. Ed, 47:101 (Feb.) 1958.

Recognizing the instability of glucose solution as one of the major problems encountered in the field of parenteral medication, the authors of this paper point out that little has been accomplished in prolonging the shelf-life of glucose injections, in spite of the numerous studies which have been reported in the literature. The purpose of this study was to determine the effect of glucose concentration upon the rate of its decomposition in solution, to study the effect of added ions upon the stability of glucose solutions, and to measure the effect of temperature upon the rate of glucose decomposition.

The results indicated that, at a given temperature, the rate of decomposition of glucose in solution varied inversely with its concentration; that the decomposition reaction of glucose is subject to general acid-base catalysis and that, therefore, solutions containing combinations of glucose with inorganic ions might be expected to decompose upon autoclaving to a greater extent than solutions containing glucose alone.

WARREN E. MCCONNELL

BORIC ACID SOLUBILITY

A Solubility Study of the Boric Acid-Water-Sorbitol System at Various Temperatures, Sciarra, J. J., Autian, John, and Foss, N. E., J. Am. Pharm. Assoc., Sci. Ed., 47:144 (Feb.) 1958.

A study of the effects of the addition of varying concentrations of sorbitol and of temperature change on the solubility and heat of solution of boric acid in water was made. The studies were conducted over a temperature range of from 21° to 60° C. The results of the experiments showed that the solubility of boric acid in water varies directly as the concentration of sorbitol increases and as the temperature increases. A maximum solubility of boric acid of 25.7% concentration was obtained at 60° with a sorbitol concentration of 52.1%.

The data are tabulated and graphs are presented which relate boric acid concentration, temperature, and sorbitol concentration. A phase diagram of the boric acid-water-sorbitol system is also given.

WARREN E. MCCONNELL

ISOTONICITY DETERMINATIONS

A Simplified Graphic Method for the Preparation of Isotonic Solutions, Hammarlund, E. R., and Pedersen-Bjergaard, Kaj, J. Am. Pharm. Assoc., Sci. Ed., 47:107 (Feb.) 1958.

Freezing point depressions for a series of concentrations of 332 drugs were determined and, from these data, graphs relating freezing point depression to drug concentration were constructed for each individual drug. These graphs form the basis for a rapid determination of the amount of sodium chloride necessary to be added to yield an isotonic solution of a given volume with any concentration of each drug. The graphical method is described and several examples are given to illustrate its applications.

A comprehensive table, listing the sodium chloride equivalents of 332 drugs at 1%, 3%, and 5% concentrations and at the concentration yielding isotonicity, is presented.

WARREN E. MCCONNELL

EPINEPHRINE INJECTION, PREPARATION OF

Our Experiences in Preparing Sterile Parenteral Solutions of Adrenaline, Rajic, K. Z., Vojnosanitetski Pregled 9:194, 1957.

Maintaining adequate reserves of drugs for military use often necessitates longer periods of storage than those encountered in civilian practice. The author has conducted an experiment to determine the stability of parenteral solutions of epinephrine (adrenaline) over long periods of storage.

Experimentally, five different solutions containing various preservatives and stabilizers were made and heat sterilized. These solutions were stored under various conditions at temperatures varying from -23° to 42° C. Before and after a five-year storage period the solutions were evaluated for color, specific gravity, pH, pyrogens, refraction, light absorption, and amount of epinephrine. In addition, two of the solutions which contained ascorbic acid were assayed for ascorbic acid content.

Four of the solutions tested proved unsatisfactory. One exhibited a lowered epinephrine content after the five-year storage period. It also produced a pyrogenic reaction before and after storage. Both of these characteristics were attributed to a high (0.5%) sodium metabisulfite content. Another solution, although colorless, showed an increase in absorption of 6.4% over the five-year storage period. A significant decrease in epinephrine content was also observed. A third solution, containing ascorbic acid, but no sodium metabisulfite, exhibited a 14% decrease in epinephrine. Still another, containing both ascorbic acid and sodium and potassium metabisulfite, revealed a 10% loss of epinephrine after storage. In both of the latter solutions the ascorbic acid content was also greatly reduced (99 and 40% respectively). The author concluded that, in solutions sterilized by heat, ascorbic acid is a poor stabilizer of epinephrine, being itself in need of a stabilizer under these conditions. A fifth solution which proved most satisfactory, showed constancy of form after sterilization and storage. It contained: basic epinephrine, 0.1%; N-hydrochloric acid, 0.8%; benzoic acid, 0.2%; chlorobutanol, 0.1%; sodium chloride, 0.8%; sodium metabisulfite, 0.1%; and potassium metabisulfite, 0.1% in distilled water. The success of this formulation was attributed to the combination of benzoic acid and sodium and potassium metabisulfites as stabilizers and to the absence of ascorbic acid.

JOHN D. LUCASSE

CLOSURE FOR VIALS CONTAINING MOISTURE-LABILE DRUGS

Practical Notes: A New Process for Closing Vials Containing Penicillin, Boll. Chim. Farm. (Milan) 96:218 (May) 1957.

The Glaxo Laboratories have patented a new process for the hermetic sealing of glass vials containing penicillin, streptomycin, and other products sensitive to deterioration in the presence of moisture. A series of rigorous experiments were carried out to determine the antibacterial activity of penicillin kept in glass vials after prolonged periods in moist climates. These containers were the ordinary glass vials consisting of a wide neck sealed with a rubber stopper under pressure and capped with an aluminum seal. The tests revealed that this type of container did not afford sufficient protection against the loss of penicillin potency. This problem was found to be particularly acute in tropical and subtropical countries.

The new container consists of a rubber stopper which fits completely within the narrow neck of the vial. The rubber stopper, which is thin enough to permit readily the penetration of a customary-sized hypodermic needle, has a flange which fits into a corresponding seat within the neck of the vial. The top of the vial immediately above the rubber stopper is covered with a thick thermoplastic sheet possessing bactericidal activity. This sheet is applied with an automatic machine using a special heat process to close it around the neck of the vial. The glass vial is finally capped with a metal capsule containing an opening in the center to permit passage of the hypodermic needle.

Tests conducted under extreme conditions of temperature, humidity and pressure have proved that this new type of closure assures a firm seal, an easier penetration of the hypodermic needle and a more certain guarantee of asepsis. (A diagrammatic sketch of the essential elements used in the sealing process is included with the original text.)

JOHN BROOKS
ALBERT L. PICCHIONI

READING SKILLS

Do Your Reading Skills Need an Overhaul? Marble, T. F., General Electric Review 60:17 (Nov.) 1957.

The professional man with a scientific, engineering, or financial background has a greater need for training in reading skills. Evidence indicates that his careful attention to words and figures that he learned in college seriously slows him down in areas of reading outside of his own speciality.

The average scientific degree holder had his last reading training in the fourth grade at an age of nine years. Fifteen percent of the population read at a fifth-grade level and over one-half of the population read no better than seventh-grade students.

The average engineer and scientist spend three to four hours per day reading. The amount of mathematical training this person has had may go as far as two or three courses in calculus and yet he will use this mathematical training on the average only 15 minutes every other day.

It has been shown that the average scientist reads at a rate of 220 words per minute while housewives and non-scientific persons with the same amount of education read at an average of 418 words per minute.

There are three types of equipment used in the reading-training field. The tachistoscope is an instrument used to flash numbers, words, and figures on a screen at brief intervals. It is used to train the eyes of the students to accurately and quickly absorb words from the page. Training films are used to project printed material on the screen and to allow the student to read only according to a fixed pattern. Habits of proper eye movement are established by this. A reading pacer is used to force the student to read at a certain speed.

A reading course can do three things. It can give the student information about reading, practice in techniques to improve reading skills, and an opportunity to discuss reading problems.

Some of the points that the reading course should bring out are as follows: The eye does not move across the page but makes a series of fixations. The fewer the number of fixations needed per line the better the reader. The good reader must be able to read rapidly. Good comprehension should be a good reader's goal, but 100% comprehension is not necessary. Reading is limited by a person's vocabulary. A person's reading vocabulary should be larger than his speaking vocabulary. A good reader can adjust his speed to the level of difficulty of the material.

The main factor in being a good reader is practice. A small amount of training along with interest and practice will bring about increased reading skills.

JOHN D. LUCASSE

CURRENT LITERATURE

. . . also calling your attention to the following articles appearing in recent hospital and pharmaceutical journals

. . . . . .

ADMINISTRATION

—Dispensing

Whitcomb, William: Patient Medications and Dosage Accuracy, *Am. Profess. Pharm.* 24:316 (Apr.) 1958.

—Ward Stocks

Teplitsky, Benjamin: Nursing Drug Cabinets—Their Inspection, *Hosp. Management* 85:132 (Apr.) 1958.

CENTRAL SERVICE

Anderson, Mary Helen: Establishing a Central Service Department in a Hospital, *Hosp. Management* 85:80 (Apr.) 1958.

INSTITUTES AND SEMINARS

Moravec, Daniel F.: The University of Texas Tenth Annual Hospital Pharmacy Semina, *Hosp. Management* 85:116 (May) 1958.

LAWS AND LEGISLATION

Regan, William S.: What the Law Says About Hospital Pharmacy, *Modern Hosp.* 90:102 (May) 1958.

POISON CONTROL

Goddard, James L.: Accidental Poisoning in Childhood, *Hosp. Progress* 39:110 (Apr.) 1958.

PURCHASING

Ceruzzi, Frank: Perpetual Inventory: Big Dividends for Small Hospitals, *Hospitals* 32:61 (Apr. 1) 1958.

Heeb, Joseph A.: Trends in Hospital Puchasing, *Hosp. Progress* 39:139 (Apr.) 1958.

Mix, Martin A.: General Use of Purchasing Forms, *Hosp. Management* 85:122 (May) 1958.

GENERAL

Francke, Gloria N.: Annual Administrative Reviews—Pharmacy, *Hospitals* 32:81 (Apr. 16) 1958.

DRUG EVALUATIONS

by the Council on Drugs of the American Medical Association

► THE FOLLOWING MONOGRAPHS and supplemental statements on drugs have been authorized by the Council on Drugs of the American Medical Association for publication and inclusion in *New and Nonofficial Drugs*. They are based upon the evaluation of available scientific data and reports of investigations. In order to make the material even more valuable, dosage forms and preparations of individual drugs have been added to the monographs. These dosage forms and preparations were not taken from material published in the *Journal of the American Medical Association* by the Council on Drugs; rather, they were obtained from such manufacturers' brochures, news releases, etc., which were available to us at the time of publication. An attempt has been made to make the list of dosage forms as complete as possible. However, no guarantee can be made that the list of preparations is complete and it is suggested that hospital pharmacists consult manufacturers' releases for additional dosage forms and preparations.

The issues of the *Journal of the American Medical Association* from which each monograph has been taken is noted under each monograph. Monographs in this issue of the JOURNAL include those published in the *Journal* to April 1, 1958.

Notice

New and Nonofficial Drugs 1958 is now available from your local bookstore and from the publishers, J. B. Lippincott Company, Philadelphia, Pa. This 1958 edition contains monographs of drugs evaluated by the Council on Drugs of the American Medical Association and published in the Journal of the A.M.A. to January 1, 1958. The index listed below contains those drugs evaluated and published between January 1, 1958 and April 1, 1958.

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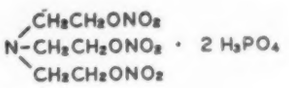
Aminotrate Phosphate

Metamine®
Nitretamin®

AMINOTRATE PHOSPHATE is triethanolamine trinitrate diphosphate.—The structural formula of aminotrate phosphate may be represented as follows:



Actions and Uses

Aminotrate phosphate, an organic nitrate compound, produces a mild but persistent vasodilating effect on smooth muscle, especially that of the smaller blood vessels of the postarteriolar vascular bed. As with other agents in this category, this effect is believed to be dependent on the release of nitrite ion in the body. The drug also produces some degree of coronary vasodilation as indicated by its ability to improve blood supply and to relieve myocardial ischemia in the isolated rabbit heart. In human patients, clinically demonstrable effects referable to coronary vasodilation are not apparent until some time after administration of the drug. Thus, aminotrate phosphate is considered to be much slower acting than either glyceryl trinitrate (nitroglycerin) or amyl nitrite. On the other hand, its coronary vasodilating effects are much more prolonged than those produced by either of these agents. In contrast to most organic nitrates, aminotrate phosphate does not, in therapeutic doses, appreciably lower blood pressure or cause reflex tachycardia.

Aminotrate phosphate has been used prophylactically in the hope of preventing attacks of angina pectoris in patients subject to this disorder. Although few of the clinical reports available to date are well controlled, it is the impression of most observers that the drug is beneficial in reducing the frequency and severity of anginal attacks in some patients. However, therapeutic response to the drug appears to be variable and unpredictable; whereas some patients experience decided improvement under therapy, many others obtain no relief whatsoever. Although it is not possible to determine the precise percentage of patients in whom a favorable response might be expected, currently available evidence suggests that this will not exceed 50% and may be considerably less. Aminotrate phosphate shows about the same order of effectiveness as pentaerythritol tetranitrate. Because of its slow onset of action, aminotrate phosphate is not suitable for the immediate relief of anginal pain and is not intended to replace glyceryl trinitrate for this purpose.

Aminotrate phosphate appears to be better tolerated than most of the other nitrates used in the therapy of angina pectoris. Thus, the headaches, dizziness, gastric upset, nausea and vomiting, and palpitation which frequently complicate therapy with the other agents are encountered only infrequently. Although methemoglobinemia is a rare complication of nitrate therapy, aminotrate phosphate is believed to be safer in this respect for patients with anemia. Aminotrate phosphate increases intraocular pressure and is contraindicated in the presence of glaucoma.

Dosage

Aminotrate phosphate is administered orally. Although development of tolerance has not been reported, such an effect is to be expected on the basis of previous experience with other long-acting nitrates and physicians should be on the alert for it. Present evidence suggests that the dosage for aminotrate phosphate can remain constant for considerable periods without loss of effect. For the prophylaxis of angina pectoris, the usual daily dose is 8 to 16 mg. taken in divided doses before meals and before retiring. Somewhat larger doses have occasionally been employed. There may be no significant effect before the third day of administration, and a period of a week or more may elapse before maximal effects are apparent.

Preparations: tablets 2 mg. and 10 mg.; tablets (sustained-release) 10 mg.

Applicable commercial names: Metamine, Nitretamin.

Thos. Leeming & Co., Inc. and E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of aminotrate phosphate.

J.A.M.A. *166*:1329 (Mar. 15) 1958.

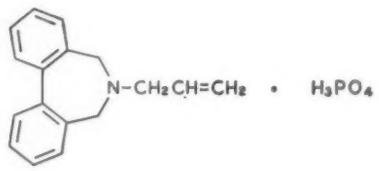
Preparations

Tablets Aminotrate (Metamine; Nitretamin) Phosphate 2 mg.
Tablets Aminotrate (Metamine) Phosphate, Sustained Action, 10 mg.
Tablets Aminotrate (Metamine) Phosphate 2 mg. with Butabarbital 15 mg.

Azapetine Phosphate

Ilidar® Phosphate

AZAPETINE PHOSPHATE is 6 allyl-6,7-dihydro-5H-dibenz[c,e]azephine phosphate.—The structural formula of azapetine phosphate may be represented as follows:



Actions and Uses

Azapetine phosphate is a potent adrenergic blocking agent with actions and uses similar to those of tolazoline hydrochloride. In addition to blocking the vasoconstrictive response of smooth muscle to circulating or injected epinephrine, the drug also exerts a direct vasodilating effect on the wall of small blood vessels. The chief pharmacological effects of the drug are therefore related to peripheral vasodilation and include increases in skin temperature and peripheral blood flow as well as moderate decreases in blood pressure. Parasympathetic effects or changes in gastrointestinal tone and motility are minimal after adrenergic blockade with this agent.

Azapetine phosphate is useful for the treatment of those peripheral vascular diseases in which vasospasm is the predominant cause of ischemia. These include such conditions as Raynaud's syndrome, acrocyanosis, acroparesthesia, causalgia, ulceration of the extremities due to chronic peripheral vasospasm, and sequelae of frostbite. The drug is considered ineffective in most patients with organic occlusive forms of peripheral vascular disease, such as arteriosclerosis obliterans, thromboangiitis obliterans (Buerger's disease), and acute arterial occlusion. Its value in the treatment of thrombophlebitis or the postphlebitic syndrome has not been established. Azapetine has also been used for the management of moderate to severe hypertension, but there is insufficient evidence to establish its effectiveness for this purpose.

Except for occasional instances of drug fever, serious untoward effects are rare during therapy with azepetine phosphate. Side-effects, however, are fairly common. Nausea, vomiting, lightheadedness, weakness, malaise, syncope, and postural hypotension frequently complicate therapy with this agent. Other less common side-effects include confusion, palpitation and tachycardia, anorexia, nasal congestion, headache, and xerostomia. As with all other adrenergic blocking agents, azapetine is contraindicated in any condition in which a fall in blood pressure may be undesirable or dangerous; thus, it should not be given to patients with severe coronary artery disease. Since adrenergic substances normally relax bronchial musculature, there is a presumptive small risk in administering adrenergic blocking drugs to patients with bronchial asthma. It has been reported that the administration of azapetine was associated with the reactivation of a previously diagnosed peptic ulcer; the reason for this is not established since there are no reported studies on the effects of this drug on gastric secretion.

Dosage

Azapetine phosphate is administered orally. An initial test dose of 25 mg. three times daily should be given for about seven days to screen out the occasional patient who cannot tolerate the drug. Thereafter, the usual dose for adults is about 50 to 75 mg. three times a day as determined by individual response.

Preparations: tablets 25 mg.
Applicable commercial name: Ilidar Phosphate.
Hoffmann-LaRoche, Inc., cooperated by furnishing scientific data to aid in the evaluation of azapetine phosphate.
***J.A.M.A. 166*:1481 (Mar. 22) 1958.**

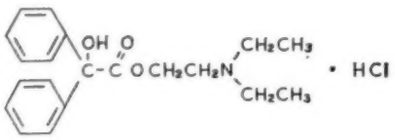
Preparations

Tablets Azapetine (Ilidar) Phosphate 25 mg.

Benactyzine Hydrochloride

Suavitil® Hydrochloride

BENACTYZINE HYDROCHLORIDE is 2-diethylaminoethyl benzilate hydrochloride.—The structural formula of benactyzine hydrochloride may be represented as follows:



Actions and Uses

Benactyzine hydrochloride, a diphenylmethane, is an anticholinergic compound with the same actions and effects but with approximately only one-fifth to one-fourth the activity of atropine. Benactyzine, however, usually produces an effect on the central nervous system with doses that elicit little or no peripheral effects. The mechanism of central action is not known, although observations in experimental animals tend to support the assumption that the drug acts on the hypothalamus in such a manner as to raise the threshold of emotional reaction to external stimuli. In rats subjected to mental stress, benactyzine increases the number of conditioned responses to a fixed stimulus. In normal human tests subjects, therapeutic doses produce prompt subjective effects variously expressed as retardation of mental activity, blocking of thought, and feeling of muscular relaxation. Dizziness and ataxia may also occur. Objectively, the electroencephalogram shows a reduction in normal rhythm and sometimes abolition of alpha waves. This abolition coincides with the height of subjective effects. Because the drug does not exhibit sedative or hypnotic action and does not affect body temperature or blood pressure, it is not considered a tranquilizing agent in the sense in which that term applies to drugs that exert a depressant action.

Benactyzine hydrochloride is proposed for clinical use as a psychotherapeutic agent in the management of psychoneurotic disorders with anxiety reaction, obsessive-compulsive reaction, or mild depressive reactions. In general, it is stated that optimal benefits are more likely to occur in patients whose attitude is cooperative, whereas patients with a hostile attitude may deteriorate under therapy. Also, short-term neuroses which may have remissions tend to respond better than chronic, fixed disorders. It must be borne in mind that, as with certain other agents, psychoneurotic manifestations in some patients will occasionally be enhanced after the use of benactyzine. Reports of clinical investigations are somewhat contradictory regarding effectiveness of the drug in the conditions for which it is proposed. Some observers feel that it is less effective than other psychotherapeutic drugs but may be more effective than the barbiturates in dealing with psychoneurotic symptoms. The drug appears to have practically no effect in the management of psychotic symptoms. On the basis of currently available evidence, the use of benactyzine appears to have been followed by improvement in about one-half of the patients in whom it was employed, but more conclusive clinical observations are necessary to establish its ultimate usefulness.

Benactyzine hydrochloride appears to have a low toxicity in both animals and man. In human subjects, experimental doses of 60 mg. daily for one month, or 90 mg. as a single dose, did not reveal serious toxic effects. The effect of the drug appears promptly after administration, and perceptible effects produced by a single oral dose of 5 mg. disappear within one to one and one-half hour. The drug is eliminated rapidly, chiefly in the urine. The brain appears to retain the drug longer than other tissues, but there is no apparent residual action or accumulation.

Because of its anticholinergic nature, benactyzine hydrochloride may give rise to side-effects similar to those of atropine. Side-effects so far reported include dryness of the mouth, metallic taste, blurred vision, inhibition of accommodation, dizziness, giddiness, ataxia, nervousness, palpitation, nausea, diarrhea, general apathy, and indifference. When present, such effects may disappear with slight reduction in dosage. The chief subjective complaints are usually diminished ability to concentrate and a sense of depersonalization or unreality. In some patients, these may be sufficiently disturbing to warrant cessation of therapy to avoid intensifying the neurotic state. Other patients may complain of excessive muscular relaxation, with heaviness and paresthesia of the limbs. Prior explanation of such effects may reduce the unfavorable response in some patients.

Benactyzine hydrochloride is contraindicated in patients who are frankly hostile. The drug is also considered to be contraindicated in glaucoma because of its anticholinergic properties. Benactyzine hydrochloride should not be administered to patients who are to receive electroshock therapy. As with all new drugs, physicians should be alert to the possibility of untoward effects, which may appear with more extensive use.

Dosage

Benactyzine hydrochloride is administered orally. The suggested initial oral dosage for adults is 1 mg. three times daily for two or three days. If such doses elicit no therapeutic response, they may be increased gradually to 3 mg. three times daily. Administration after meals is considered desirable to minimize the occurrence of side-effects arising from unusually prompt absorption. Should side-effects occur at a particular dosage, it should be reduced. Dosages totaling more than 10 mg. daily are not considered desirable for any patient. However, until longer experience has been gained, the dosage of the drug should be considered tentative, and all patients observed carefully for the development of untoward effects.

Preparations: tablets 1 mg.
Applicable commercial name: Suavitil.
Merck Sharp & Dohme, Division of Merck & Co., Inc., cooperated by furnishing scientific data to aid in the evaluation of benactyzine hydrochloride.
***J.A.M.A. 166*:1326 (Mar. 15) 1958.**

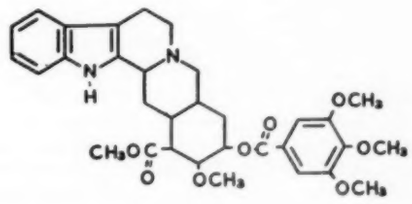
Preparations

Tablets Benactyzine (Suavitil) Hydrochloride 1 mg.

Deserpidine

Harmonyl®

DESERPIDINE is 11-desmethoxyreserpine.—The structural formula of deserpidine may be represented as follows:



Actions and Uses

Deserpidine, an ester alkaloid isolated from Rauwolfia canescens Linn, is identical in chemical structure to reserpine except that it lacks the methoxy (CH_3O-) group at the 11 position. The pharmacological actions of deserpidine are essentially the same as those of other active alkaloids of Rauwolfia, including reserpine. On the basis of animal experiments and some clinical observations, deserpidine is said to have a more rapid onset of action than reserpine, is somewhat less potent, and produces less lethargy and depression. However, these minor differences are probably of little clinical significance from the standpoint of over-all effectiveness or dosage requirements, and both drugs have the same uses and limitations. (See the monograph on reserpine in New and Nonofficial Drugs.)

Dosage

Deserpidine is administered orally. For the treatment of mild anxiety states and mental disturbances, doses of 0.1 mg. per day may be sufficient. At least 2 to 3 mg. daily is required for the treatment of institutionalized patients with psychosis. For the treatment of mild essential hypertension, the initial dose is 0.25 mg. three or four times daily until the desired response has been obtained. Thereafter, blood pressure may be maintained with doses of as little as 0.25 mg. per day.

Preparations: tablets 0.1, 0.25, and 1 mg.
Applicable commercial name: Harmonyl.
Abbott Laboratories cooperated by furnishing scientific data to aid in the evaluation of deserpidine.
J.A.M.A. 166:1329 (Mar. 15) 1958.

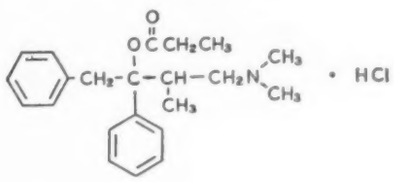
Preparations

Tablets Deserpidine (Harmonyl) 0.1 mg., 0.25 mg., and 1 mg.

Dextro Propoxyphene Hydrochloride

Darvon® Hydrochloride

Dextro Propoxyphene Hydrochloride is -*α*-*d*-4-dimethylamino-1,2-diphenyl-3-methyl-2-butanol propionate hydrochloride.—The structural formula of dextro propoxyphene hydrochloride may be represented as follows:



Actions and Uses

Dextro propoxyphene hydrochloride, a tertiary-amino ester, is a synthetic, non-antipyretic, orally effective, analgesic compound, which is related pharmacologically to codeine. Milligram for milligram, dextro propoxyphene hydrochloride and codeine phosphate are approximately equal in analgesic potency, and both are used for the relief of the same type of pain. Like codeine, but unlike morphine and some of the more potent analgesics, dextro propoxyphene produces no respiratory depression after the administration of therapeutic doses. Its onset and duration of action are similar to those of codeine. Its absorption, metabolism, and excretion are not known.

Dextro propoxyphene hydrochloride is useful for the relief of mild to moderate pain, especially that associated with chronic or recurrent diseases as, for example, in rheumatoid arthritis or in migraine. It can be used with other analgesics to augment their effectiveness and may prove to be useful for the relief of pain in many, but not necessarily all, situations in which codeine is ordinarily used. In rheumatoid arthritis it may well be combined with an anti-inflammatory agent, such as acetylsalicylic acid. The drug is not of sufficient potency to be of value in severe pain. It has little or no antitussive activity.

The addicting liability of dextro propoxyphene hydrochloride has been extensively studied, and the evidence indicates that the drug has either little or none. In animals, no tolerance to the analgesic or lethal effects of the drug can be demonstrated after several weeks of chronic administration. In humans, prolonged administration produces none of the signs or symptoms which are considered characteristic of drug addiction; psychic craving or euphoria is not observed; tolerance or dependence is not produced, and abrupt termination of therapy fails to result in any significant withdrawal symptoms. Furthermore, large single doses of the drug do not produce opiate-like effects in nontolerant, former narcotic addicts. The sole basis for considering dextro propoxyphene an addicting drug lies in its ability to suppress the symptoms of abstinence from morphine. However, this effect is quite weak, is less than that of codeine, and is not considered sufficient reason to establish the drug as an addicting agent. Hence, dextro propoxyphene does not come under the purview of the federal narcotic law.

The toxicity of dextro propoxyphene hydrochloride is low and the margin of safety adequate. Nausea and vomiting have been noted but have occurred less frequently than with codeine. Large doses may also produce drowsiness and dizziness. Except for the rare patient who may exhibit hypersensitivity, at present there are no known contraindications to administration of dextro propoxyphene. The drug should not be given parenterally because of local irritating action.

Dosage

Dextro propoxyphene hydrochloride is administered orally. The usual dose for adults is 65 mg. four times daily, alone or with other medication, as required for the relief of pain.

Preparations: capsules 32 mg. and 65 mg.
Applicable name. Darvon.
Eli Lilly and Company cooperated by furnishing scientific data to aid in the evaluation of dextro propoxyphene hydrochloride.
J.A.M.A. 166:1481 (Mar. 22) 1958.

Preparations

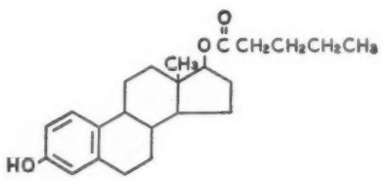
Capsules Dextro Propoxyphene (Darvon) Hydrochloride 32 mg. and 65 mg.

Capsules Dextro Propoxyphene (Darvon) Hydrochloride 32 mg. with Phenacetin 162 mg., Aspirin 227 mg., and Caffeine 32.4 mg. (Compound).

Estradiol Valerate

Delestrogen®

Estradiol Valerate is estradiol-17-valerate.—The structural formula of estradiol valerate may be represented as follows:



Actions and Uses

Estradiol valerate, an ester of estradiol, has the same actions and uses and is subject to the same contraindications as other estrogens. (See the general statement on Ovaries and the subsection on Estrogens in New and Nonofficial Drugs.) The onset of action is prompt after a single intramuscular injection of an oil solution of the drug. Estrogenic effects persist for about three weeks. The drug is well

tolerated, and, in therapeutic doses, undesirable side-effects are no more troublesome than those produced by other injectable oil solutions of estrogenic substances. It also can be administered concomitantly with a suitable progestational agent in the management of functional uterine bleeding and primary or secondary amenorrhea.

Dosage

Estradiol valerate is injected intramuscularly as a solution in sesame oil. For uterine or ovarian dysfunction or menstrual disorders, the usual single dose is 5 to 20 mg. This is generally repeated once every four weeks or once each menstrual period. For local manifestations of estrogen deficiency, such as pruritus vulvae, kraurosis vulvae, or senile vaginitis, the usual dose is 10 to 20 mg. repeated once after two to three weeks. For relief of postpartum breast engorgement when lactation is to be suppressed, a single dose of 10 to 25 mg. may be injected immediately after delivery.

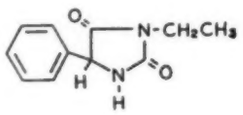
Preparations: solution (injection) 10 mg. in 1 cc.
Applicable commercial name. Delestrogen.
E. R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of estradiol valerate.
***J.A.M.A.* *166*:1482 (Mar. 22) 1958.**

Preparations

Injection Estradiol Valerate (Delestrogen) 10 mg. per ml.; 1 ml. and 5 ml. vials.

Ethotoin — Peganone®

ETHOTOIN is 3-ethyl-5-phenylhydantoin.—The structural formula of ethotoin may be represented as follows:



Actions and Uses

Ethotoin, a hydantoin-type anticonvulsant, is useful for the treatment of grand mal epilepsy. The therapeutic dosage of ethotoin is greater than that of many commonly used anticonvulsants, such as diphenylhydantoin, primidone, or phenobarbital. On the other hand ethotoin is considerably less toxic than any of the foregoing drugs and, unlike the barbiturates, does not produce sedation at therapeutic dosage levels. When used alone in grand mal epilepsy, it generally brings about a reduction in seizure frequency but may not always afford complete seizure control. It may be useful as a substance to try first, particularly if immediate control of grand mal seizures is not essential for social or economic reasons. If full control of the seizures is not obtained by use of ethotoin alone, it may be combined with other anticonvulsant drugs. In certain patients, it will control seizures that are refractory to other anticonvulsant agents. Ethotoin is of limited usefulness in psychomotor seizures. It has been tried in cases of petit mal and petit mal variant seizures. Although its usefulness is limited in this type of epilepsy, it may bring about improvement in some cases.

Ethotoin appears to have fewer side-effects than the other hydantoin derivatives in common use as anticonvulsants. In clinical trials over long periods of time and with high dosage, no evidence of kidney, liver, or hematopoietic damage has been observed. Only rare instances of ataxia or gum hyperplasia have occurred, and these reactions were found in patients undergoing treatment with other hydantoin derivatives. Occasionally encountered side-effects include skin rash, dizziness, anorexia, nausea and vomiting, diplopia, drowsiness, numbness, headache, tension, epigastric burning, nystagmus, gastrointestinal upset, and depression. Many of these side-effects respond promptly to a reduction in dosage; gastric distress may be minimized if the drug is administered with food. Although ethotoin appears to be a substance of low toxicity, the possibility of serious untoward reactions should be kept in mind, pending the accumulation of more clinical experience.

Dosage

Ethotoin is administered orally in dosages which must be individualized according to the response of the particular patient and the degree of control achieved with other anticonvulsant drugs. The average dose for adults is 2 to 3 Gm. per day, given after food, in four to six divided doses. Dosages below 2 Gm. a day have proved ineffective in most adult patients. It is generally advisable to avoid a high initial dose. The recommended procedure is to begin treatment with not more than 1 Gm. daily and to increase the dose gradually over a period of several days, in order to determine the patient's individual tolerance and the optimal dosage. Doses as high as 5 Gm. a day have been used but are seldom necessary. When doses this size are required, it is considered wise to supervise the patient more closely.

Doses of 0.5 to 1 Gm. daily have been found effective in many children. However, amounts of 2 Gm., or more rarely 3 Gm., have been used successfully. An appropriate dosage will depend to some extent on the age and weight of the child and on the type and dose of concomitant medication. As with adults, it is considered advisable to start with a comparatively low dosage which may be increased gradually.

If the patient is already receiving another anticonvulsant medicament, it should be continued when ethotoin is started. Usually the dosage can be gradually reduced as that of ethotoin is increased, until ethotoin has replaced the previous medicament or until the optimal dosage of both anticonvulsants has been established. When ethotoin is combined with other hydantoins, the dose of the latter should be gradually reduced in order to avoid ataxia and other side-effects which occur with high doses of such other hydantoins.

Preparations: tablets 250 mg. and 500 mg.
Applicable commercial name: Peganone.
Abbott Laboratories cooperated by furnishing scientific data to aid in the evaluation of ethotoin.
***J.A.M.A.* *166*:1327 (Mar. 15) 1958.**

Preparations

Tablets Ethotoin (Peganone) 0.25 Gm. and 0.5 Gm.

Iron-Dextran Complex — Imferon®

IRON-DEXTRAN COMPLEX is a colloidal solution of ferric hydroxide in complex with partially hydrolyzed dextran.

Actions and Uses

Iron-dextran complex is a stable, isotonic solution of inorganic iron held in chemical combination with the polysaccharide, dextran. The dextran used in this complex is of low molecular weight and is pharmacologically distinct from the dextran of high molecular weight that is sometimes employed as a blood volume expander. Iron-dextran complex is relatively nonirritating when injected intramuscularly and provides a concentrated and well-tolerated form of iron for the parenteral therapy of iron deficiency anemia. Except for patients with intercurrent infections, the iron thus administered is utilized almost quantitatively for hemoglobin formation. Rapid absorption of the drug is indicated by the appearance of hemosiderin in the bone marrow 12 hours after intramuscular injection. Hence, iron-dextran complex raises hemoglobin levels and restores depleted iron stores more rapidly and in a more predictable manner than orally given iron.

Iron-dextran complex is indicated solely for the treatment of iron deficiency anemia in those situations in which parenteral therapy is deemed preferable to oral medication.

The drug is particularly useful in patients who cannot tolerate orally given iron preparations or who have gastrointestinal conditions, such as ulceration or severe diarrhea, which would contraindicate the use of iron given orally, as well as in cases of impaired iron absorption. It is also effective for the rapid replenishment of iron stores in selected patients in whom oral therapy is ineffective. Thus, in the treatment of hypochromic anemias of infancy or in the last trimester of pregnancy, iron-dextran complex will often provide a prompt clinical and hematological response in the unusual patient who may be resistant to orally given iron therapy. The substance also finds some use in selected hemorrhagic states, including gastrointestinal bleeding, in which available iron stores have been depleted and in which oral therapy cannot provide iron at a sufficiently rapid rate to meet the needs for hemoglobin formation. It is also useful postoperatively to replace transfusions to some degree. Finally, iron-dextran complex may be used in patients who cannot be relied upon to take oral medication, such as infants, geriatric and psychiatric patients, and occasionally in obstetrical patients.

Iron-dextran complex should be restricted for use only in diagnosed cases of iron deficiency anemia. If no iron deficiency exists, prolonged (and hence, improper) therapy with this agent will cause storage of iron, with consequent possibility of exogenous hemosiderosis. Such iron overload is particularly prone to occur in patients with hemoglobinopathies and other refractory anemias which might be erroneously diagnosed as iron deficiency anemia. Hence, if a hematological response is not observed after initiation of iron-dextran complex therapy, injections should be discontinued and other diagnostic measures taken. Of perhaps even greater importance from the standpoint of rational therapeutics is the necessity to seek the underlying cause of iron deficiency anemia and to treat that cause as well as to replace the needed iron. Physicians should guard against the false security which might be engendered when relatively mild hypochromic anemias of unknown pathogenesis show remarkable improvements with iron therapy. It should be borne in mind that chronic occult blood loss, often from gastrointestinal lesions, is a common cause of iron deficiency anemia in adults.

On the basis of both laboratory and clinical experience, the toxicity of iron-dextran complex appears to be low, and the drug is considered safer to administer than the intravenously administered preparation, saccharated iron oxide. No serious systemic or local reactions have been observed, although a mild type of urticarial reaction is occasionally encountered. Rarely, a more generalized type of reaction that is typical of any parenteral injection may follow the administration of iron-dextran complex. This may be characterized by headache, fever, malaise, nausea, vomiting, aching of the lower extremities, and regional lymphadenopathy. Some patients report pain at the site of injection, but there is no evidence that iron-dextran complex causes damage to muscle tissue, even after repeated administration.

Dosage

Iron-dextran complex, which contains the equivalent of 50 mg. of elemental iron in each cubic centimeter, is administered by intramuscular injection only. Before initiating therapy, the total iron requirement should be calculated by using a dosage table or a convenient formula. The most precise calculations of dosage are based on hemoglobin deficit, as determined by consulting a table of normal hemoglobin levels. Thus, for adults, the following formula might be applied: [normal value of hemoglobin (grams per 100 cc.)—patient's hemoglobin level (grams per 100 cc.)] X 0.255 = grams of iron needed. After the total iron requirement has been calculated, iron-dextran complex is injected daily or every other day until the required amount is given. A dosage of 50 mg. (1 cc.) is generally administered the first day, and amounts up to 250 mg. (5 cc.) daily may be given thereafter to normal or obese adults. Children who weigh over 9 kg. (20 lb.) and small adults should receive no more than 100 mg. (2 cc.) daily. Dosage for children of 3.6 to 9 kg. (8 to 20 lb.) is 50 mg. (1 cc.) daily; the maximum for infants weighing under 3.6 kg. (8 lb.) is 25 mg. (0.5 cc.) daily. Repeat courses of iron-dextran complex are not usually indicated.

Iron-dextran complex is deep red in color and causes staining of the skin if the solution is allowed to leak along the tract of the needle. In order to avoid this a long needle should be used for intragluteal injection and the subcutaneous tissue over the site of injection should be firmly pushed aside before inserting the needle.

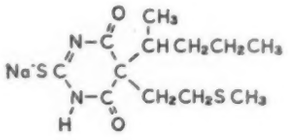
Preparations: solution (injection) equivalent to 100 mg. of elemental iron in 2 cc. and 250 mg. in 5 cc.
Applicable commercial name: Imferon.
Lakeside Laboratories, Inc., cooperated by furnishing scientific data to aid in the evaluation of iron-dextran complex.
***J.A.M.A.* *166*:1482 (Mar. 22) 1958.**

Preparations

Injection Iron-Dextran Complex (Imferon) 50 mg. (elemental iron) per ml.; 2 ml. and 5 ml. ampuls.

Methitural Sodium — Neraval® Sodium

METHITURAL SODIUM is 5-(1-methylbutyl)-5-[2-(methylthio)ethyl]-2-thiobarbiturate.—The structural formula of methitural sodium may be represented as follows:



Actions and Uses

Methitural sodium, an ultra short-acting thiobarbiturate, is used as an intravenously administered anesthetic agent. Since its potency is less than that of thiopental sodium, larger doses are required to produce the same degree of anesthesia. Like other thiobarbiturates, methitural is stored temporarily in body fat depots and subsequently is transported to the liver, where it is metabolized. Because its metabolic degradation and excretion proceed more rapidly than those of thiopental, cumulative effects are less and awakening time is more rapid. These differences are more apparent when larger amounts of the drug are used for longer operative procedures. Anesthetic induction time is longer with methitural and should proceed more slowly than with thiopental

Methitural sodium is employed for the same purpose as the sodium salts of thiopental, hexobarbital, and thiamylal. Thus, it may be used as the sole anesthetic agent in short operative procedures, for induction prior to the administration of gaseous general anesthetics in long operations, and as a supplement to local anesthetics during regional and spinal anesthesia. The drug does not provide muscle relaxation but is compatible with and may be used in conjunction with curare and curariform drugs. Belladonna alkaloids should be administered as premedication. Once sufficient experience has been gained in the use of methitural sodium, general anesthesia with this agent appears to be as smooth and as satisfactory as that obtained with thiopental. Its diminished cumulative effects and rapid awakening time are considered advantageous. There is also some indication that methitural produces somewhat less postanesthetic "hangover" than the other thiobarbiturates. On the other hand, parasympathomimetic effects, such as hiccups, coughing, and laryngospasm, seem to be greater with methitural than with thiopental. These effects plus increased induction time

and venous irritation with concentrated solutions constitute disadvantages.

Side-effects to methitural sodium are those of intravenously administered barbiturates in general and include hypotension, respiratory depression, hypoxia, laryngospasm, and excitement. The drug should be used with caution in patients with dyspnea, asthma, respiratory obstruction, severe hypotension or hypertension, myocardial disease, cardiac decompensation, anemia, and extreme obesity. It is contraindicated in patients with severe hepatic dysfunction. Methitural should be administered only by anesthesiologists competent in the use of thiobarbiturates in intravenous anesthesia; equipment and facilities for providing oxygen and insuring adequate respiration should be available at all times.

Dosage

Methitural sodium is administered intravenously. Except for concentration and dosage, the techniques and procedures for the intravenous administration of methitural sodium are the same as for other thiobarbiturates. For intermittent administration, the most satisfactory concentration appears to be a 2.5% solution; 5% solutions have been used, but at this concentration venous irritation is likely to be encountered. For induction of general anesthesia in adults, 4 or 5 cc. of a 2.5% solution is injected at intervals of 30 to 60 seconds. Although the rate of injection and dosage vary, the administration of 200 to 600 mg. in this manner is usually sufficient to induce anesthesia in most patients. After induction, small maintenance doses (2 or 3 cc. of a 2.5% solution) may be injected at intervals governed by the usual signs relating to depth of thiobarbiturate anesthesia. The total dosage of methitural should probably not exceed 2 Gm. in most patients. The drug may also be administered by slow intravenous drip of a 0.5 to 0.8% solution to supplement other forms of anesthesia.

Preparations: powder (injection) 1, 2, and 5 Gm.
Applicable commercial name: Neraval Sodium.
Schering Corporation cooperated by furnishing scientific data to aid in the evaluation of methitural sodium.
***J.A.M.A.* *166*:1328 (Mar. 15) 1958.**

Preparations

Injection Methitural (Neraval) Sodium 1 Gm., 2 Gm., and 5 Gm. vials.

Parethoxycaine Hydrochloride

Intracaine® Hydrochloride

PARETHOXYCAINE HYDROCHLORIDE is 2-diethylaminoethyl *p*-ethoxybenzoate hydrochloride.—The structural formula of parethoxycaine hydrochloride may be represented as follows:

Actions and Uses

Parethoxycaine hydrochloride is a local anesthetic agent with actions similar to those of procaine. Its acute toxicity in experimental animals is slightly more than that of procaine. Parethoxycaine is rapid-acting, and the duration of anesthesia is slightly longer than that produced with an equal amount of procaine. In animal experiments, the drug appears to be somewhat more potent, milligram for milligram, than procaine. Except for these minor quantitative differences, parethoxycaine hydrochloride behaves pharmacologically in essentially the same manner as procaine hydrochloride.

Parethoxycaine hydrochloride is proposed for use in regional anesthesia by either infiltration or nerve block techniques, including dental procedures, for single injection or continuous spinal anesthesia, for peridural segmental anesthesia, for caudal anesthesia in obstetrics, and for topical anesthesia in cystoscopic, bronchoscopic, or endotracheal procedures. Clinical experience with the drug for all of the foregoing procedures has been too meager to permit definite conclusions as to its efficacy and safety. On the basis of limited studies conducted almost two decades ago, the drug appears to be about as satisfactory as procaine for those techinques involving parenteral injection, but it does not possess any advantage which would distinguish it from procaine, lidocaine, tetracaine, or any of the other local anesthetic agents that have undergone much more extensive clinical investigation.

When the drug is employed by the low spinal route, the onset of sensory anesthesia appears to be somewhat more rapid than with procaine. However, the duration of such anesthesia is not proportional to dose. Thus, in spite of its slightly increased potency, dosage of parethoxycaine for long operative procedures approaches that of procaine. The drug should not be used as a spinal anesthetic for operations above the lower abdomen. There is no clinical evidence to support its use for topical or surface anesthesia of mucous or other membranes.

On the basis of limited clinical experience, parethoxycaine appears to be of about the same order of toxicity as procaine. The drug does not produce irritation at the site of injection but does elicit the same type of effect on blood pressure, pulse, and respiration which is observed after administration of procaine and similar local anesthetic agents. It should therefore be employed with the same discretion as all other agents in this category. (See the general statement on local anesthetics in New and Nonofficial Drugs.)

Dosage

For regional anesthesia, the concentration of parethoxycaine hydrochloride solution and the amount injected vary according to clinical indications and the duration and extent of anesthesia desired. A 0.3 to 1% solution is proposed for infiltration anesthesia, whereas a 1 to 1.5% solution is suggested for nerve block techniques. For dental procedures, by either infiltration or nerve block techniques, a 1% solution has been used. Epinephrine hydrochloride, in a final dilution of 1:200,000, may be added when desired to solutions of parethoxycaine hydrochloride used in regional anesthesia. For single injection spinal anesthesia, a 2.5% solution may be employed; dosage varies from 0.6 to 2 cc. (15 to 50 mg.). A 2.5% solution of the drug in cerebrospinal fluid is employed for continuous spinal anesthesia; the suggested initial dose is 4 to 6 cc. (100 to 150 mg.) followed by 1 to 2 cc. (25 to 50 mg.) as needed. For peridural segmental anesthesia, 2.5 cc. (50 mg.) of a 2% solution is administered. Concentrations of 1.5% are suggested for caudal anesthesia. The proposed dosage for topical anesthesia of mucous membranes, as in cystoscopic, bronchoscopic, and endotracheal procedures, is 5 cc. of a 2 to 5% solution. Since there is no evidence to confirm the usefulness of parethoxycaine as a topical anesthetic, the foregoing proposed dosage for this purpose should be considered experimental.

Solutions of parethoxycaine hydrochloride become cloudy when exposed to air; hence, suitable dilutions of the sterile crystalline drug should be freshly prepared and used at once.

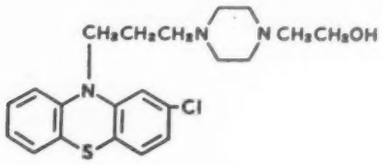
Preparations: crystals (injection) 1 Gm.; ointment 2% and 5%; solution (injection) 20 mg. in 1 cc., 50 mg. in 1 cc.
Applicable commercial name: Intracaine Hydrochloride.
E.R. Squibb & Sons, Division of Olin Mathieson Chemical Corporation, cooperated by furnishing scientific data to aid in the evaluation of parethoxycaine hydrochloride.
***J.A.M.A.* *166*:1330 (Mar. 15) 1958.**

Preparations

Ointment Parethoxycaine (Intracaine) Hydrochloride 2 percent and 5 percent in Plastibase; 1 ounce tubes and 1 pound jars.

Perphenazine — Trilafon®

PERPHENAZINE is 2-chloro-10-{3-[4-(β-hydroxyethyl)piperazinyl]propyl}phenothiazine.—The structural formula of perphenazine may be represented as follows:



Actions and Uses

Perphenazine, a phenothiazine compound, differs chemically from prochlorperazine only with respect to the substitution of a hydroxyethyl group for the methyl group of the latter drug. Perphenazine is approximately twice as potent, milligram for milligram, as prochlorperazine and exhibits depressant actions, clinical uses, and side-effects similar to those of chlorpromazine. Thus, perphenazine is useful in the treatment of psychoneuroses predominantly characterized by anxiety, tension, and agitation, in certain psychotic disorders, for the control of hiccough, and also as an antiemetic for the control of nausea and vomiting. Although perphenazine, like prochlorperazine, appears to have an over-all clinical toxicity somewhat less than that of chlorpromazine, physicians should be alert to the possibility of the development of jaundice, blood dyscrasias, or neurological sequelae referable to extrapyramidal involvement and should maintain close supervision of patients to avoid these complications.

Dosage

Perphenazine is administered orally, intramuscularly, and, rarely, intravenously. For oral use in the management of mild anxiety and tension states or as an antiemetic, the dose for adults ranges from 2 to 4 mg. three or four times daily. Doses of 4 to 8 mg. three times daily by mouth are suggested for ambulatory patients with psychoneurosis. For the treatment of institutionalized patients with psychosis, the total oral dose for adults ranges from 16 to 64 mg. per day given in two to four divided doses. The usual oral dosage for children between 1 and 6 years of age is 2 mg. two or three times daily; for children between the ages of 6 and 12 years, the oral dose is 2 mg. three or four times a day. A total daily oral dose of more than 12 mg. is seldom necessary to elicit a favorable response in children.

Perphenazine may be injected intramuscularly when rapid effect or prompt control of an acute or intractable situation is required or when oral therapy is not feasible. The usual initial dose is 5 mg. This may be repeated every six hours. The total daily dosage usually should not exceed 15 mg. in ambulatory patients or 30 mg. in hospitalized patients. Oral therapy should be substituted as soon as practicable.

Intravenous administration of perphenazine is not recommended except when absolutely necessary to control severe vomiting, intractable hiccoughs, or acute symptoms, such as violent retching during surgery. When indicated, the drug should be administered at a rate not to exceed 1 mg. per minute, and the total intravenous dose should not exceed 5 mg. The drug is preferably given diluted in isotonic sodium chloride solution, with use of either fractional injection or slow drip infusion.

By all routes of administration, the lower range of adult dosage may be used in children over 12 years of age.

Preparations: solution (injection) 5 mg. in 1 cc.; syrup 0.4 mg. in 1 cc.; tablets 2, 4, 8, and 16 mg.
Applicable commercial name: Trilafon.
Schering Corporation cooperated by furnishing scientific data to aid in the evaluation of perphenazine.
J.A.M.A. 166:1330 (Mar. 15) 1958.

Preparations

Injection Perphenazine (Trilafon) 5 mg. per ml., with Sodium Biphosphate 20 mg., Exsiccated Sodium Phosphate 1.5 mg., Sodium Bisulfite 1 mg. and Exsiccated Sodium Sulfite 1 mg., in Water for Injection; 1 ml. ampuls.
Syrup Perphenazine (Trilafon) 2 mg. per 5 ml.; 4 oz. bottles.
Tablets Perphenazine (Trilafon) 2 mg., 4 mg., 8 mg., and 16 mg.

Regional Ileitis — Current Status of Therapy in

Report to the Council

The Council has authorized publication of the following report. Nonproprietary terminology is used for all drugs that are mentioned; when such terminology is not considered to be generally well known, its initial appearance is supplemented by parenthetic insertion of names known to be applied to commercial preparations.

H. D. KAUTZ, M.D., *Secretary.*

BURRILL B. CROHN, M.D., NEW YORK

Regional ileitis is a low-grade granulomatous disease of the small bowel, usually involving 8 to 16 inches of the terminal loop of the ileum, just proximal to the ileocecal valve. The disease is nonspecific in nature; the etiology is unknown. The onset of the disease usually begins in youth. The average age of a person at which this occurs is 27 years. The clinical picture is dominated by diarrhea, abdominal pain, loss of weight, a moderate secondary anemia, and the formation of a tender mass in the right lower quadrant of the abdomen. Fistula formation is characteristic of the disease, with the fistulas appearing usually on the abdominal wall in the scar of a previous operation or as perirectal abscesses and fistulas.

The disease is one of low-grade intensity, pursuing a course covering many years. The complications consist of hemorrhage, rarely perforation, but not infrequently of bouts of intestinal obstruction.

Regional ileitis is not entirely a surgical disease. In fact, the disappointment with the late follow-up of surgical intervention has more and more emphasized the need for a well-apportioned and carefully thought-out plan for the conservative medical treatment of this condition.

With the establishment of the diagnosis, unless urgent and immediate surgical indications are present, a plan of medical therapy should be initiated.

Medical Management

The diet should be general and generous and should include all proteins, carbohydrates, and, to a more limited degree, fats. With the exception of raw fruits and raw vegetables, which constitute roughage, the diet should be tasty, flavored, and unrestricted. Sieving or puréeing of vegetables is unnecessary; proteins should be stressed, steak and roast beef particularly. The English school is now emphasizing the fact that the disease is one characterized by steatorrhea; however, since the fat absorption by the intestine is adequate in most cases, fat restriction in the diet is unnecessary.

Rest, both physical and mental, is essential. Excessive exercise and tensely competitive games are taboo; much sleep and relaxation are necessary. Most patients are ambulatory and may follow their profession or business activities in a somewhat limited fashion. Although ileitis is not regarded as one of the so-called psychosomatic diseases, recurring psychic trauma should be eliminated whenever possible. A hopeful attitude looking to ultimate cure should be engendered. A change of air, particularly to the beaches in the summer, is beneficial.

Medication is palliative though not necessarily curative. The diarrhea and abdominal pain may be controlled by a fluid mixture containing belladonna, codeine, and deodorized opium tincture in sufficient dosage to control the bowel urgency. This mixture may be taken over long periods of time; addicts are rarely made in this manner.

The antibiotics are useful only in the presence of secondary infection or in the acute febrile toxic states. The disease

is not cured by antibiotics, which in themselves often induce secondary diarrhea. The suppurative complications resulting from fistula formations, particularly the perirectal complications, require the use of antibiotics. Since penicillin and the tetracyclines tend to produce micrococcic (staphylococcic) or monilial diarrhea, they are best not employed. Chloramphenicol (Chloromycetin) or erythromycin (Erythromycin, Ilotycin) are safest in their effects. The milder acting sulfonamides, phthalylsulfathiazole (Sulfathalidine) or succinylsulfathiazole (Sulfasuxidine) may be employed for maintaining the antibacterial effects in the intestinal tract.

Adrenal cortical steroid therapy has a significant place in the treatment of regional ileitis. Although the immediate effects are not as striking as those found in ulcerative colitis, beneficial results can be observed in the feeling of euphoria, increased appetite, gain in weight, and reduction of bowel movements. The best results are produced in ileitis when suppurative complications are not present, the most brilliant results in jejuno-ileitis with diffuse and nonlocalized involvement of the whole or upper small intestinal tract. Here the adrenal steroids may approach an almost specific form of therapy. The treatment should be initiated by a course of intramuscular injections consisting of 40, 60, or 80 U. S. P. units daily of corticotropin (Acthar, Corticotropin, Acth), purified corticotropin, or corticotropin-zinc hydroxide (Cortrophin-Zinc). If this dosage is too small, it may be necessary to increase it to obtain the required effect. This is usually a safe procedure; perforation of the bowel has rarely been reported, none in my own experience. Because of the diarrhea, salt restriction in the diet is unnecessary; administration of potassium, as triple potassium salts or the chloride, should best accompany the treatment. After daily injections of corticotropin for 10 to 14 days, the daily dosage should slowly be diminished for another two weeks at which time the oral administration of adrenal steroids should be substituted. A dosage of 5 mg. of hydrocortisone (Cortef, Cortril, Hycortole, Hydrocortone), prednisone (Deltasone, Deltra, Meticorten) or prednisolone (Delta Cortef, Hydeltra, Meticortelone), given three or four times daily is required. Eventually a maintenance dose of at least 10 mg. daily may and should be maintained over an indefinite period of time. Should surgical intervention become necessary at any time, adrenal steroid therapy should be stepped-up to overcome adrenal atrophy; at the time of operation 50 to 100 mg. of hydrocortisone given intravenously is essential to overcome the danger of shock manifestations.

Electrolyte balance should be maintained at all times. When severe depletion has occurred, sodium and potassium should be replaced by intravenous injections. Transfusions of whole blood are indicated to combat severe anemia and protein depletion.

Vitamin deficiency is rarely encountered in regional ileitis or jejuno-ileitis, probably because of the liberal diet which is employed. Secondary anemia requires oral administration of iron and an adequate protein intake.

Surgical Management

Surgical intervention is indicated when conservative therapy fails or when an abdominal mass, fever, continued loss of weight, and progressive anemia develop. Complications, such as perirectal abscesses and fistulas, persistent abdominal wall fistulas, intestinal hemorrhage, or, above all, intestinal obstruction, require surgical reparation.

Among surgeons, the approach is fairly evenly divided throughout the country between those who favor primary resection and those who favor some type of a short-circuiting procedure, with perhaps a majority favoring the latter. Necessarily the short-circuiting procedure, usually a side-to-side ileotransverse colostomy, should be accompanied by a transection of the ileum (12 inches proximal to uppermost extension of the disease) as a diversion of the intestinal content away from the lesion. Rarely is it necessary to perform a two-step procedure, since the first-stage, short-circuiting procedure results in subsidence of all symptoms (except the diarrhea). Evidences of failure of the original lesion to heal after the short-circuiting, as demonstrated by persistent fever, mass, and still-extending fistulas, constitute indication for the second-stage resection of the by-passed lesion.

Recurrent, postoperative ileitis is best treated conservatively. The recurrence is usually less severe than the original disease, fortunately is not usually progressive, and requires only conservative medical therapy.

1075 Park Avenue.

J. A. M. A. 166:1479 (Mar. 22) 1958.

Psychotherapeutic Drugs

Report to the Council

The Council has authorized publication of the following report. Nonproprietary terminology is used for all drugs that are mentioned; when such terminology is not considered to be generally well known, its initial appearance is supplemented by parenthetic insertion of names known to be applied to commercial preparations.

H. D. KAUTZ, M.D., *Secretary.*

The introduction of a multiplicity of psychotherapeutic drugs and of new terms, such as tranquilizer, ataraxic, normalizer, calmative, neurosedative, psychic energizer, pacific, anticonfusion and antihallucinatory, creates a difficult situation for the average physician. He is confronted with the problem of evaluating claims of usefulness for a wide variety of chemical substances with diverse pharmacological effects, which are proposed for the treatment of neurotic and psychic disorders.

The terms "tranquilization" or "ataraxia" in referring to the human mental state have been variously defined, but for simplicity they can be considered to be more or less synonymous with "peace of mind." As such, they are obviously psychological rather than pharmacological terms, since the state can be produced by a multitude of drugs which either depress or stimulate the central nervous system and by others which exert only a peripheral effect on organ structures. Thus, a tranquil state can be accomplished by nonspecific sedation (alcohol, barbiturates), by analgesics (acetylsalicylic acid, morphine), by skeletal muscle relaxants (mephenesin, meprobamate), by autonomic suppressants (chlorpromazine, reserpine), and by many others. "Peace of mind" can also be created in depressed individuals by the judicious use of substances that are pharmacological stimulants, such as amphetamine. In the broadest sense, therefore, the reversal of any clinical disorder, even by drugs with only peripheral effects (epinephrine in asthma and digitalis in cardiac decompensation), can result in "peace of mind" by relieving anxiety. This concept is the fundamental basis of psychosomatic medicine.

From a practical point of view the time has long since passed when it would be useful, or even possible, to attempt to establish the designation "tranquilizer" or even "specific tranquilizer" as a pharmacological term that could be considered synonymous with what might be termed "autonomic suppression." Likewise, it is no longer feasible to limit the application of such a term to particular substances, such as chlorpromazine and reserpine, whose introduction into psychotherapeutic practice, because of unique pharmacological properties, created the present dilemma. Indeed, it appears probable that the gradually increasing number of new drugs, as well as new terms, will add to rather than detract from the confusion in this important field.

It seems wise to bear in mind that regardless of terminology, the ideal objective of psychotherapy with drugs is to induce an improved mental state, irrespective of what subjective symptom or objective sign is being treated. This should be done with agents that produce no undesirable subjective responses, are lacking in toxic side actions, and exert no summative effects with other drugs unless the latter are beneficial.

In accordance with the foregoing considerations, the Council has voted to abandon the section on Ataraxics in New and Nonofficial Drugs and to describe agents proposed

for use for their particular effects on the central nervous system, in accordance with their fundamental pharmacological classification, insofar as this is known. On the basis of present knowledge, the drugs in this general category can be classified under the following headings:

I. Antihistamines
  A. Psychotherapeutic antihistamines
    a. Hydroxyzine (Atarax) hydrochloride
II. Central Nervous System Depressants
  A. Nonselective Depressants
    1. Analgesics
    2. General anesthetics
    3. Hypnotics and sedatives
  B. Selective Depressants
    1. Anticonvulsants
    2. Antihistamines (as above)
    3. Antitussives
    4. Central muscle relaxants (skeletal muscle relaxants), nonsedative
      a. Mephenesin (Avosyl, Dioloxol, Kinavosyl, Lissephen, Mephenesin, Mepherol, Mephson, Myoten, Myoxane, Oranixon, Prolax, Saserol, Sinan, Spasmolyn, Tolansin, Tolosate, Toloxyn, Tolserol, Tolulox, Tolyspaz)
      b. Mephenesin carbamate (Tolseram)
    5. Central muscle relaxants (skeletal muscle relaxants), sedative
      a. Meprobamate (Equanil, Miltown)
      b. Phenaglycodol (Ultran)
      c. Promoxolane (Dimethylane)
    6. Central parasympathetic suppressants
      a. Benactyzine (Suavitil) hydrochloride
    7. Central sympathetic suppressants, phenothiazine derivatives
      a. Chlorpromazine (Thorazine) hydrochloride
      b. Mepazine (Pacatal) hydrochloride
      c. Perphenazine (Trilafon) hydrochloride
      d. Prochlorperazine (Compazine) maleate
      e. Promazine (Sparine) hydrochloride
      f. Trifluprom azine (Vesprin) hydrochloride
    8. Central sympathetic suppressants, rauwolfia derivatives
      a. Alseroxylon (Rauwiloid)
      b. Deserpidine (Harmonyl)
      c. Rauwolfia (Raudixin, Rauserpa)
      d. Rescinnamine (Moderil)
      e. Reserpine (Rauloydin, Raurine, Reserpine, Reserpoid, Roxinoid, Sandril, Serpasil, Serpiloid)
III. Central Nervous System Stimulants
      a. Methylphenidate (Ritalin) hydrochloride
      b. Pipradrol (Meratran) hydrochloride
IV. Miscellaneous Agents
      a. Azacyclonol (Frenquel) hydrochloride

J.A.M.A. *166*:1040 (Mar. 1) 1958.

Upper Respiratory Infections

Current Status of Therapy in

Report of the Council

The Council has authorized publication of the following report. Nonproprietary terminology is used for all drugs that are mentioned; when such terminology is not considered to be generally well known, its initial appearance is supplemented by parenthetic insertion of names known to be applied to commercial preparations.

H. D. Kautz, M.D., *Secretary.*

Floyd W. Denny Jr., M.D. and
John H. Dingle, M.D., Cleveland

Infections of the upper respiratory tract are the most common illnesses suffered by man; their treatment, therefore, constitutes one of the largest problems faced by many physicians. A study in a group of Cleveland families has shown that respiratory infections accounted for two-thirds of all illnesses, the average incidence being over six respiratory infections per person per year. Less than 1% of these illnesses involved the lower respiratory tract, and less than 3% were caused by bacteria. In a similar study in university students, Evans reported that less than 10% of all respiratory illnesses were caused by recognized bacteria; about 70% were infections of the upper respiratory tract.

At the present time, no antimicrobial agents are available that are effective in the treatment of nonbacterial respiratory diseases; on the other hand, effective means of therapy are available for the bacterial infections of the tonsils and the pharynx. The group A hemolytic streptococci are the etiological agents in most of the bacterial infections that will respond to specific therapy. The knowledge that rheumatic fever and acute hemorrhagic glomerulonephritis can be prevented by adequate treatment of streptococcic infections has emphasized the need for prompt recognition and treatment of these illnesses. Specific therapy occasionally becomes necessary for complications of viral respiratory infections and rarely for infections due to bacteria other than the group A streptococci. Therefore, the main problem in the management of patients with upper respiratory tract infection is one of diagnosis, which, for the most part, means the identification of streptococcic sore throats.

A current classification of upper respiratory infections is presented as follows. It includes the bacterial, viral, and fungal infections that involve principally the upper respiratory tract, and also the bacterial and viral infections in which the involvement of the upper respiratory tract is a minor part of a more extensive infection. The diagnosis and treatment of these infections, both supportive and specific, will be discussed. In addition, the complications that are encountered while using specific therapy and the methods for the prevention of respiratory infections will be outlined.

Classification of Upper Respiratory Infections

Involvement of Upper Respiratory Tract (Outstanding):
  Bacterial
    Streptococcic sore throat
    Diphtheria
    Vincent's infection
  Viral or presumably viral
    Common cold
    Herpangina
    Adenovirus infection
    Herpes simplex infection
  Fungal
    Thrush
Involvement of Upper Respiratory Tract (Minor Part of More Extensive Infection):
  Bacterial
    Meningococcic infection
    Hemophilus influenzae infection
  Viral or presumably viral
    Influenza
    Infectious mononucleosis
    Rubeola
    Rubella
    Roseola infantum
    Poliomyelitis

General Aspects of Treatment

Symptomatic and supportive treatment of patients with upper respiratory infections, regardless of etiology, consists of rest, analgesia, and relief of local symptoms. Rest should be assured, and sedatives, such as the barbiturates, should be used if necessary. Acetylsalicylic acid (aspirin) is the drug

From the departments of preventive medicine, pediatrics, and medicine, School of Medicine, Western Reserve University, and the University Hospitals.

of choice for relieving generalized malaise and localized aches and pains. Care should be exercised in the administration of this drug to children because of the possibility of overdosage and the production of salicylism. Sore throat usually responds to the administration of aspirin, but in severe cases codeine may be necessary. Some patients also obtain relief from the pain and "tightness" of sore throat infections by the use of warm gargles or irrigations with isotonic sodium chloride solution. A local vasoconstrictor in isotonic sodium chloride solution may be used as nose drops for the relief of nasal congestion, but such medication should be limited to the duration of the acute infection.

Cough, when troublesome, can be controlled by the use of humidifiers and codeine. It seems to make little difference whether the moisture added to the air is hot or cold. Codeine alone or cough syrups containing codeine are equally effective. Adequate fluid intake should be insured, particularly in infants with fever, but solid foods are not contraindicated if well tolerated. Such "cold cures" as special diets, purgatives, diuretics, diaphoretics, alkalis, counterirritants, vitamins, antihistamines, and medicated lozenges and sprays are not effective.

An attempt should be made in every upper respiratory infection to establish an etiological diagnosis. Since antibiotic or chemotherapeutic agents are not effective in viral infections of the upper respiratory tract, they should not be employed. If the infection is caused by a bacterial agent, therapy directed against the specific organism should be given. It should be emphasized that, when the appropriate drug has been selected, it should be administered in effective doses long enough to produce maximal benefits.

Specific Diagnosis and Treatment of Major Upper Respiratory Infections

Streptococcic Sore Throat.—Infections with group A streptococci are characterized by the sudden onset of sore throat, headache, fever, chilliness, malaise, abdominal pain, nausea, and vomiting. Sore throat is the most outstanding symptom and is usually associated with acute pain on swallowing. The temperature of the patient varies, but it is generally over 101 F (38.3 C). Gastrointestinal symptoms of abdominal pain, nausea, and vomiting are more common in children than in adults. Simple coryza, hoarseness, and cough are not usually prominent. Physical examination shows diffuse redness and enlargement of the tonsils and of the lymphoid tissue of the pharynx. The uvula is occasionally edematous. Discrete to confluent yellowish white exudate may be found on the tonsils and on the pharyngeal wall but rarely on the uvula. The lymph nodes at the angle of the jaw are swollen and tender. With high fever there may be a flush to the skin, and the appearance of the rash of scarlet fever is diagnostic of a streptococcic infection.

Experience has shown that about one-half of the respiratory infections caused by the Streptococcus organisms are not typical enough to permit a firm clinical diagnosis. In this event, a leukocyte count and a throat culture are of great value. The leukocyte count is typically elevated, usually to above 12,000 per cubic millimeter, but counts above 20,000 are not rare. The presence of large numbers of hemolytic streptococci on a blood-agar plate is almost always diagnostic.

When the diagnosis of a streptococcic infection is made, antibacterial therapy should be instituted as rapidly as possible. However, the delay that is necessary to confirm the diagnosis bacteriologically does not reduce the efficacy of penicillin in the prevention of rheumatic fever. Penicillin is the drug of choice, and the intramuscular route is recommended because it insures adequate treatment. Regardless of how the drug is administered, it is essential that the patient be treated for a period of 10 days to insure eradication of the organisms..

The following regimens, listed in the order of preference, have been found to be satisfactory: 1. Benzathine penicillin G (Bicillin, Permapen): one intramuscular injection of 600,000 units (children) or 900,000 units (adults). 2. Procaine penicillin G with aluminum monostearate in oil (Depo-Penicillin, Lentopen): one intramuscular injection of 300,000 units (children) or 600,000 units (adults) every third day for three doses. 3. Procaine penicillin G as an aqueous suspension: one intramuscular injection of 300,000 units every day for 10 days. 4. Penicillin in the form of a buffered soluble salt of penicillin G, potassium penicillin O (Cer-O-Cillin Potassium), or phenoxymethyl penicillin (Pen-Vee, V-Cillin): 250,000 to 500,000 units (depending on the form) given orally four times a day for 10 days, administered 30 minutes before meals or 2 hours after meals.

Other antibiotics are not as effective as penicillin in eradicating streptococci or in preventing the nonsuppurative complications; therefore, their use should be reserved for patients who cannot tolerate penicillin. In such patients erythromycin (Erythromycin, Ilotycin), tetracycline (Achromycin, Panmycin, Polycycline, Tetracyn), chlortetracycline (Aureomycin) hydrochloride, or oxytetracycline (Terramycin) hydrochloride should be given in full therapeutic doses for 10 days, or approximately 22 to 44 mg. per kilogram (10 to 20 mg. per pound) of body weight per day for children and 1 to 2 Gm. per day for adults. Treatment with the sulfonamide drugs is not effective.

Diphtheria.—In contrast to most other infections of the upper respiratory tract, diphtheria is a serious and, at times, fatal disease. Fortunately, its occurrence is now rare, but its potential danger should keep every physician alert to its diagnosis. It is not within the scope of this paper to review completely the symptoms, signs, and treatment of diphtheria; instead, a few of the more salient points in the management of these patients will be discussed.

The principal finding in patients with diphtheria is a gray, adherent membrane, often with tenuous edge, that may extend even beyond the tonsils and occasionally over the uvula. The tonsils frequently are large, but the mucosa of the pharynx is not usually as red as that found in streptococcic infections. The lymph nodes in the neck are enlarged. The patient is febrile and may appear more prostrated and have a faster pulse than the physical signs in the throat would indicate, although usually the fever is not as high and the general and local symptoms not as severe as with a streptococcic infection.

The initial diagnosis of diphtheria must be made by clinical means; it is not safe to delay treatment until laboratory confirmation is obtained. When the diagnosis of diphtheria is suspected, antitoxin should be administered in full therapeutic doses as soon as it can be determined that the patient is not sensitive to the antitoxin. Since the toxin produced by the diphtheria organisms is responsible for the serious nature of this disease, the administration of antitoxin is the most important aspect of therapy. It is desirable, however, to eradicate the diphtheria bacillus as quickly as possible, to prevent spread of the organism to contacts of the patient and to prevent the carrier state. Penicillin, chlortetracycline, and erythromycin have all been advised for this purpose, but their efficacy has not been adequately evaluated.

Vincent's Infection.—Vincent's stomatitis or Vincent's angina is the diagnosis given to a condition characterized by gingivitis and necrotic ulcers of the buccal mucosa, the tonsils, and occasionally the pharynx. These lesions are accompanied by varying degrees of systemic involvement. Direct smears from the lesions show spirochetes and fusiform bacilli, but there is no agreement as to whether these organisms are the actual cause of the disease or only secondary invaders. It is possible that the herpes simplex virus is a cause of some cases of Vincent's stomatitis, but this organism cannot be isolated from all cases, and it now seems probable that there are multiple etiological agents. Because the etiology cannot be determined in most cases, it is difficult to recommend specific therapy; the fact that numerous therapeutic agents have been advocated emphasizes the probability that none is entirely successful. Penicillin has

been reported to be effective but, if used, should be given parenterally and not as a mouth wash. Good oral hygiene is an important aspect of therapy.

Common Cold.—Respiratory infections classified as the common cold are the most frequent of all infections. In the study of Cleveland families, this diagnosis was made in 40% of all illnesses and in 60% of all respiratory illnesses. The common cold may be defined as a mild, usually afebrile, upper respiratory tract infection in which most of the clinical signs are caused by inflammation of the mucous membranes of the nose. Occasionally, spread to contiguous structures, the paranasal sinuses or the pharynx, may occur. Sneezing, coryza, lacrimation, and scratchy throat are common symptoms, and physical examination shows little more than a red, edematous nasal mucosa. Laboratory tests are within normal limits.

The common cold is transmissible from one human host to another; it is also transmissible to the chimpanzee but not to the common laboratory animals. In the last three decades, several investigators have reported the cultivation of a common cold virus in embryonated eggs or tissue culture. These reports have not been confirmed. Recently, Price has isolated a virus from patients with illnesses resembling the common cold and has reported that a vaccine prepared with this virus prevented illness among the children injected in an institution during an outbreak of upper respiratory infections. Sufficient data are not yet available to permit adequate evaluation of this report. In human transmission studies, as well as in epidemiologic studies in families, immunity to repeated infections has not been demonstrated. Since the clinical signs are so variable from one person to another, or even in the same person at different times, it is possible that the clinical syndrome now called the common cold is caused by multiple agents. Numerous drugs have been advocated for the specific treatment of the common cold, but none has proved to be effective when adequately tested under controlled conditions.

Herpangina.—Herpangina is an uncommon respiratory infection that may be caused by several of the Coxsackie A viruses. The characteristic lesions of this entity are commonly located on the anterior pillars of the fauces, are usually few in number, are 1 to 5 mm. in diameter, and appear as white or gray vesicles and later as ulcers surrounded by a red areola. A temperature occasionally as high as 105 F (40.5 C), sore throat, headache, myalgia, and abdominal pain are common features. The leukocyte count is usually normal, and throat culture shows normal flora. The clinical picture of herpangina is characteristic and allows a presumptive diagnosis which can be confirmed in the laboratory by isolating the virus and by demonstrating the development of antibodies to the virus in convalescent serum from the patient. The disease is self-limited; no specific treatment is available.

Adenovirus Injections.—The adenoviruses comprise a new group of viruses that were first described in 1953. These viruses are readily grown in tissue cultures, and at the present time more than 23 separate and distinct types, both of human and simian origin, have been described. Since not all adenoviruses have been associated with respiratory infections in man, mention will be made only of the two clinical entities in which there appears to be definite association between several of these viruses and upper respiratory diesase.

The type 3 adenovirus and, rarely, several of the other types have been associated with nonbacterial pharyngitis or pharyngoconjunctival fever. This disease entity accounts for only a small part, approximately 1 to 4%, of the nonbacterial respiratory infections in the civilian population. It is characterized by a temperature often as high as 103 to 104 F (39.4 to 40 C) lasting 1 to 10 days, sore throat, headache, lassitude, and, in some instances, conjunctivitis, The sore throat is usually not as severe as with streptococcic infections. On physical examination, the tonsils and the lymphoid tissue of the pharynx are enlarged; the mucosal surfaces are red, and grayish white exudate may be present. If exudate is found, it is usually in small, discrete patches in the tonsillar crypts. Conjunctivitis, when present, is follicular in character and may involve one or both eyes. Cervical lymphadenopathy is common, and the nodes may be tender. The leukocyte count is normal in most cases.

Definite diagnosis can be made only by isolating the virus in tissue culture and by demonstrating the formation of antibodies in the host by neutralization or complement-fixation titrations. These laboratory aids, however, are not usually available and clinically are of limited value, because the results frequently can be obtained only after the patient has recovered. Since specific therapy is not indicated in nonbacterial pharyngitis or pharynogoconjunctival fever, it is important only to differentiate this entity from streptococcic sore throat. This can frequently be done by clinical means and the leukocyte count, but the absence of hemolytic streptococci on throat culture is most helpful in excluding the diagnosis of streptococcic disease.

During World War II the Commission on Acute Respiratory Diseases delineated a clinical syndrome in military recruits called acute respiratory disease (or ARD). Since the discovery of the adenoviruses, it has been shown that this syndrome is commonly associated with the adenoviruses, types 4 and 7. Infection with one of these viruses is the commonest cause of upper respiratory disease among recruits in the military service but is rarely seen among civilian populations. The cause for this paradoxical situation is unknown. ARD is characterized by a gradual onset, feverishness, chilliness, headache, malaise, and anorexia. The throat is sore, but usually without pain on swallowing. Hoarseness and cough are common. The temperature averages 101 F (38.3 C). On physical examination, the pharynx is moderately red, and the tonsils and lymphoid tissue may be enlarged. The cervical lymph nodes may be palpable but are not usually large and tender. The leukocyte count is normal. As with nonbacterial pharyngitis or pharyngoconjunctival fever, the specific diagnosis can be made by virus isolation or by demonstration of an increase in antibody titer in the serum after the infection. No specific treatment is available.

Antibodies to types 1, 2, 5, and 6 adenoviruses are commonly found in civilians of all ages, and these viruses have occasionally been isolated from patients with respiratory illnesses. As yet, however, there has been no frequent or consistent association between these types of adenoviruses, or the other remaining types, and clinical respiratory disease.

Herpes Simplex Infection.—The usual disease entity associated with the herpes simplex virus is herpes labialis (cold sore, fever blister), but occasionally, on first contact with this virus, children develop acute herpetic gingivostomatitis. This disease entity is characterized by marked systemic reactions and oral lesions consisting of vesicles which rapidly rupture, leaving a gray membrane or ulcer. The tongue and cheek show these lesions most frequently, but other parts of the mouth and pharynx may be involved. The lesions are quite characteristic and are not usually confused with other infections of the throat. There is no effective therapeutic agent against the herpes simplex virus.

Thrush.—Thrush is a common infection caused by the fungus Candida (Monilia) albicans and is found principally in infants and debilitated children or adults. The disease is manifested by the appearance on the mucous membranes of the mouth and throat of confluent, pearly white, elevated patches which, when forcibly removed, leave a raw surface. Few symptoms are referable to these lesions. The diagnosis can be confirmed by demonstrating the characteristic budding, yeast-like fungus with hyphal fragments in fresh smears from the lesions, or by cultivating the fungus on common laboratory mediums. Prior to the introduction of antibiotics, corticotropin (Acthar, Corticotropin, Depo-Acth), and cortisone (Cortisone, Cortogen, Cortone) acetate, the disseminated form of the disease was rare. In recent

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years, however, pneumonia, involvement of the gastrointestinal tract, and generalized moniliasis have become more common, particularly as a complication in patients who are receiving antibiotic drugs or adrenal cortical steroids.

Thrush usually responds to the local application of a 1% solution of gentian violet, 1% solution of borax in glycerin, or a 20% aqueous solution of sodium caprylate. Attention to the over-all health of the patient is important. Recently a new antibiotic, nystatin (Mycostatin), has been found to be effective in monilial infections and can be employed locally or orally. The drug should be tried in cases resistant to the usual therapy or in cases in which the infection has spread to the gastrointestinal tract. Nystatin is poorly absorbed from the gastrointestinal tract and is probably not effective in other types of moniliasis.

Upper Respiratory Tract Infections Associated with More Extensive Disease

Meningococcic Infection.—Patients with meningococcic infections, either meningitis or meningococcemia, frequently have mild symptoms referable to the upper respiratory tract, and cultures from the throat may show the presence of meningococci. Likewise, throat cultures from contacts of these patients may show meningococci. Although the possible relationship between the meningococcus and upper respiratory disease is recognized, this organism is not considered a common cause of primary upper respiratory infections. Therefore, the only time when the presence of the meningococcus in the throat assumes importance is when it is associated with more extensive and severe disease, and treatment should be limited to these cases.

Hemophilus Influenzae Infections.—The status of the association of H. influenzae and upper respiratory tract infections is similar to that described for the meningococcus. Patients with meningitis and laryngotracheobronchitis caused by this bacterium frequently have mild upper respiratory tract symptoms, and the organism may be cultured from the throat. Primary tonsillitis or pharyngitis due to the influenza bacillus, however, has not been recognized as a clinical entity and need not be considered in the differential diagnosis of uncomplicated upper respiratory tract infections.

Influenza.—Infections with influenza viruses, types A or B, occur either as sporadic cases or, more characteristically, in epidemics. Sporadic infections are infrequently recognized because the clinical picture is usually not distinct enough to allow separation from noninfluenzal illnesses constantly present in any population. In contrast, and as illustrated by the outbreak of type A Asian strain infection, typical cases are more readily diagnosed during epidemics when 10 to 20% of a population may be expected to manifest the disease within a period of several weeks.

The onset is usually abrupt, with chilliness, feverishness, headache, weakness, pain in the eyeballs, pain in the back, muscular aches, and frequently cough. The symptoms of coryza, sneezing, and hoarseness may be present but seldom are prominent. Temperature ranges from 101 to 105 (38.3 to 40.5 C). Examination shows an acutely ill, prostrated patient with flushed face and, commonly, suffusion of the conjunctivas. The pharynx is red, and rales may be heard in the chest. The leukocyte count and the throat culture are usually within normal limits. As with most viral infections, the exact diagnosis depends on isolation of the virus or demonstration of the development of specific antibodies in the blood of the host.

Much has been written about bacterial complications in influenza. There can be little doubt that secondary bacterial infections, in particular bacterial pneumonia, contribute importantly to the death rates during epidemics of influenza. Such rates, however, have not been dramatically high in this country since the pandemic of 1918. The presently available antibiotic and chemotherapeutic drugs are not effective in the treatment of influenza, and bacterial complications so far have been infrequent. Accordingly, antimicrobial agents should be reserved until complications occur, or should be used routinely only in debilitated patients in whom complications would be especially dangerous. Patients suspected of having influenza should not be admitted to the hospital unless absolutely necessary because of the danger of cross-infections with antibiotic-resistant strains of bacteria.

Infectious Mononucleosis.—Infectious mononucleosis is a generalized disease characterized by adenopathy, splenomegaly, hepatic involvement, pharyngeal lesions, an increase in the peripheral blood of mononuclear cells, many of which may be atypical lymphocytes, and an increase in heterophil antibodies. The pharyngeal lesions vary from petechial areas on the soft palate to a dirty gray membrane on the tonsils. Infectious mononucleosis is important in the discussion of respiratory infections because it is occasionally confused with streptococcic infections or diphtheria. Antibiotics are not effective in shortening the course of infectious mononucleosis.

Others.—Symptoms referable to the upper respiratory tract have been described in rubeola, rubella, roseola infantum, poliomyelitis, and in many other diseases, both infectious and noninfectious in etiology. In these diseases symptoms of involvement of the upper respiratory tract are of secondary importance to the generalized illness and require no specific antibiotic therapy.

Bacterial Complications of Upper Respiratory Infections

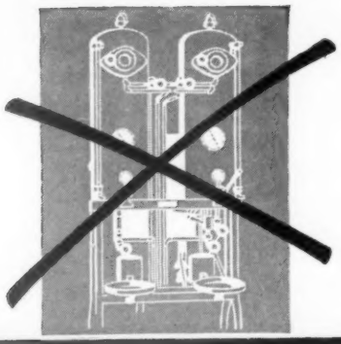
The bacterial complications that occasionally accompany or follow upper respiratory infections are otitis media, mastoiditis, sinusitis, peritonsillar cellulitis, pneumonia, and meningitis. The bacteria usually involved are hemolytic streptococci (group A), staphylococci, pneumococci, and influenza bacilli. The total incidence of these complications is so low that the prophylactic use of antimicrobial drugs is not indicated except in cases in which such complications would be especially dangerous, such as in patients with severe heart disease, nephrosis, or chronic lung infections. Normal individuals with upper respiratory infections, therefore, should be observed carefully, and specific therapy should be started only when the clinical signs indicate that a complication has arisen. Before treatment is instituted, bacterial cultures should be obtained to determine the causative organism and, if necessary, to test its sensitivity to antibacterial agents. If an ineffective drug has been chosen initially, a more appropriate one can then be administered.

The selection of an antibiotic drug for the treatment of a complication usually must be made empirically. Certain factors, however, occasionally help in making the choice and will be mentioned briefly. Complications accompanying streptococcic infections usually are caused by this same organism and respond to the administration of penicillin, the drug of choice in uncomplicated streptococcic infections. Otitis media, the commonest complication of respiratory infections, is usually caused by pneumococci, H. influenzae, or hemolytic streptococci. If an exact etiological diagnosis cannot be made, otitis media should be treated with one of the broad-spectrum antibiotic drugs.

Chemotherapy is effective in most bacterial complications, but occasionally surgical intervention is necessary. Otitis media, peritonsillar cellulitis, and mastoiditis are examples in which the response after surgical treatment is frequently dramatic.

Complications of Specific Therapy

The benefits derived from the use of chemotherapeutic and antibiotic agents far outweigh any of the reactions or complications that have arisen with the administration of these drugs. The complications that have been described with most of the agents in current use, however, are frequent and serious enough to cause some concern. Each time an antimicrobial agent is used, the physician should give careful consideration to the benefits that can be expected, as compared with the possibilities of encountering difficulty. It is the purpose of this section to call attention to the more common and serious types of complications that have been reported.



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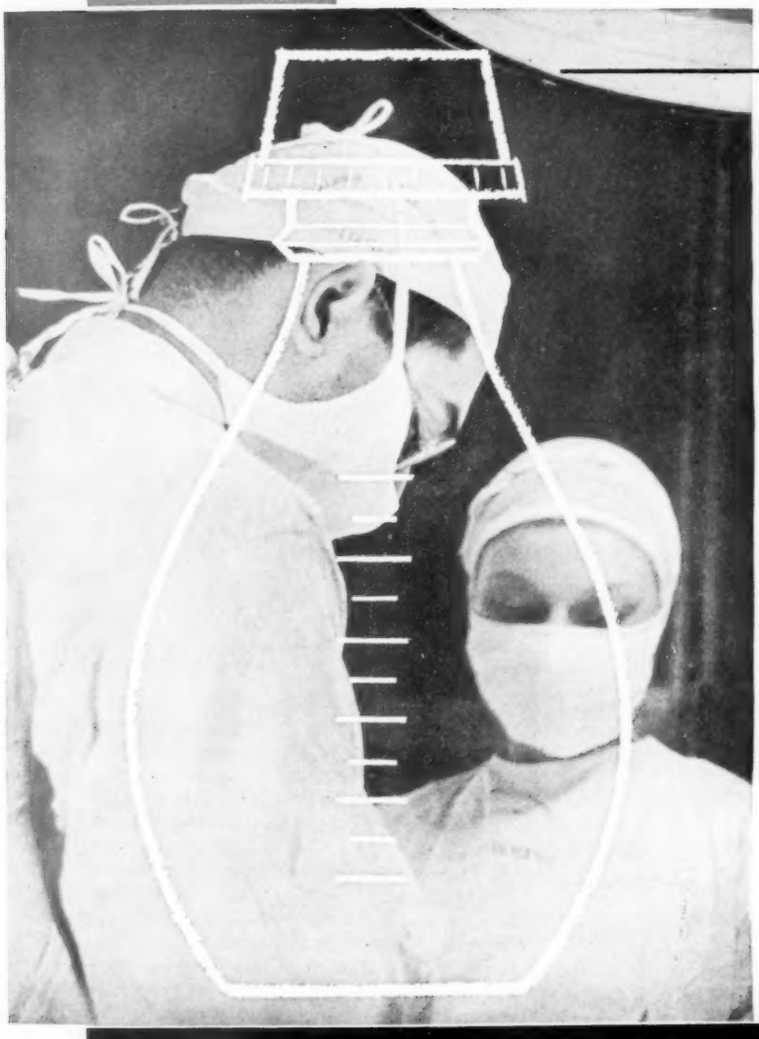

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Sensitivity Reactions.—Sensitivity reactions may occur after the use of any of the antimicrobial drugs, but more than 90% of the reported cases have occurred with penicillin. The frequency of sensitivity reactions to penicillin appears to be increasing, probably because of the increase in use of the drug and possibly because it is more antigenic than has been thought. The vast majority of penicillin reactions occur after the intramuscular injection of the drug. Angioneurotic edema and urticaria are the most frequent types of reactions and are not usually severe, unless they are associated with cerebral or respiratory involvement. Anaphylactoid reactions are not as common but are always serious. Approximately 10% of the reported cases have been fatal, and more than 100 fatalities have been recorded. Illnesses resembling serum sickness occur infrequently and are not usually severe. Other dermal reactions, including exfoliative dermatitis, hemorrhagic purpura, and erythema multiforme, occur infrequently but are usually more severe in nature. Death has occurred in 10% of the reported cases.

Gastrointestinal Disturbances.—Nausea, vomiting, and diarrhea are encountered commonly after oral administration of the broad-spectrum antibiotics but, unless associated with staphylococcic superinfection as mentioned later, are not serious in most instances.

Superinfections.—After the use of most antimicrobial agents, one or more types of bacteria and fungi will frequently appear in abnormal numbers. Candida (Monilia), staphylococci, and gram-negative bacilli are the organisms most commonly found. Enterocolitis, associated with oral use of the broad-spectrum antibiotics and due to Staphylococcus pyogenes var. aureus, is the most serious of the superinfections, particularly when it occurs as a complication of abdominal surgery. The case fatality rate is approximately 30%.

Resistant Bacteria.—Many bacteria, notably hemolytic streptococci and pneumococci, have maintained their sensitivity to most of the antibiotics. In contrast, gram-negative bacilli and staphylococci may be resistant to antimicrobial drugs or may rapidly develop such resistance. The management of infections due to these organisms is accordingly difficult, since antibiotic therapy may be ineffective. A number of studies have demonstrated that strains of staphylococci isolated in hospitals are more resistant to antibiotics than those isolated from the population at large. In general, the resistance of the hospital strains is connected with the amount and kinds of antibiotics used in a given institution. Hospital personnel become carriers of the resistant strains, and the environment becomes contaminated with these organisms. A high proportion of hospital-acquired infections are due to such strains. For these reasons, some authorities have recommended that the use of one or another of the broad-spectrum antibiotics, to which the hospital organisms are susceptible, be reserved solely for the treatment of hospital-acquired infections.

Neurotoxicity.—Vestibular and auditory disturbances have been described after the prolonged use of streptomycin and dihydrostreptomycin. The combined use of half-doses of each appears to be associated more frequently with hearing impairment that does the use of full doses of streptomycin alone.

Hematological Problems.—Aplastic anemia, leukopenia, and thrombocytopenic purpura have been reported after the use of chemotherapeutic and antibiotic agents, chiefly the sulfonamide drugs and chloramphenicol (Chloromycetin). These reactions are rare but can be quite serious, and some fatalities have been reported.

Prevention and Control

Prevention of several of the bacterial and viral diseases discussed in this paper is possible, either by the prophylactic administration of an antimicrobial drug or by the injection of a vaccine to produce protective antibodies. Of the bacterial infections discussed, streptococcic and meningococcic infections and diphtheria can be prevented. Diphtheria toxoid, alone or in combination with tetanus toxoid or pertussis vaccine, has been widely and effectively used in the control of diphtheria.

At the present time there are no vaccines effective in the control of streptococcic infections, but these infections can be prevented by the prophylactic administration of several drugs. Prophylaxis is not recommended for routine use in normal individuals living at home; treatment after the development of symptoms is the preferred routine in this situation. Prophylaxis is especially indicated in individuals who have had rheumatic fever and who are subject to recurrences of this disease after subsequent streptococcic infections. Chemoprophylaxis may also be desirable to prevent the epidemic occurrence of streptococcic infections among closed population groups, such as military installations, boarding schools, or ship's personnel. Benzathine penicillin G, 1.2 million units given intramuscularly once a month, or a buffered soluble salt of penicillin G, 200,000 to 250,000 units given orally once or twice a day(not at mealtime), or sulfadiazine, 500 mg. to 1 Gm. given daily, is effective in preventing streptococcic infections.

The prophylactic use of drugs in the prevention of meningococcic infections is not usually necessary; in some situations, however, as when meningococcic disease is occurring epidemically in closed population groups, small daily doses of sulfadiazine (500 mg. to 1 Gm.) given for several days to all individuals are indicated. This same regimen may also be desirable for the family contacts of a patient with a meningococcic infection.

No chemoprophylactic agents are effective in preventing viral respiratory diseases, but vaccines are now available for use against influenza and adenovirus infections. Influenza vaccine is prepared from the developing chick embryo and usually contains both types A and B viruses. This vaccine has been very effective during certain epidemics; at other times, however, because of the changing antigenic patterns of the influenza viruses, the available vaccine has not been effective. During widespread epidemics, when the type of virus causing infection can be predicted with considerable accuracy, a vaccine with this same strain of virus can be expected to be effective, a situation exemplified by the recent initial development and use of type A Asian strain vaccine.

In the face of an epidemic or of a limited supply of vaccine, priorities for vaccination may be required. Before a community-wide program is instituted, preference generally should be given to persons engaged in maintaining the health of the community and basic community services, and to pregnant women and patients with chronic diseases for whom influenza may constitute a special risk. The vaccine should not be administered to persons known to be highly sensitive to eggs or chickens. The usually recommended doses of vaccine are as follows: for adults, 1 cc. administered subcutaneously; for children, 5 to 12 years of age, 0.5 cc. subcutaneously, repeated in 2 to 3 weeks; and for children, 3 months to 5 years of age, 0.1 cc. intradermally or subcutaneously, repeated in 2 to 3 weeks.

A vaccine containing two or three types of adenoviruses (types 3, 4, and 7) has been developed recently by means of tissue culture techniques similar to those employed in preparing poliomyelitis vaccine. When tested among military populations, this vaccine was effective in preventing the adenovirus disease so common in recruits (ARD). Because of the rarity of adenovirus infections among civilian populations, however, there is no indication at the present time for the general use of this vaccine.

Other methods for the prevention and control of upper respiratory infections should be mentioned only to stress their ineffectiveness. Control of airborne spread by ultraviolet rays or dust suppression, special diets or vitamins, tonsillectomy and adenoidectomy, bacterial or "cold" vaccines, and antihistaminic drugs have all been championed at some time, but they have been found to be of no value when adequately tested under controlled conditions.

J.A.M.A. *166*:1595 (Mar. 29) 1958.

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Prescription Labels

To The Editor:—The introduction of drop medication on a large scale has introduced an unforeseen complication. Parents, accustomed to using drops directly on the area of involvement, i.e., the nose, ear, eye, etc., unwittingly conclude that the newer oral antibiotics are designed for local use. Despite instructions to pharmacists to indicate that the medicament is to be given by mouth, it not infrequently comes to pass that drop medicaments intended to be used orally are instilled in ears, noses, and even eyes. Obviously, this eventuality is fraught with a multiplicity of potential hazards. Many physicians have related such difficulties.

Just as "poison" labels are placed conspicuously on prescriptions of a toxic nature, labels indicating "by mouth," "for ears," "for eyes," etc., should be placed on prescriptions to avoid errors in routes of administration. Several pharmacists have said that the designation "Label as Such" in the instructions of the prescription indicates that the contents of the prescription are to be placed on the label. Most pharmacists state that they are willing to cooperate, whereas others state that such a procedure constitutes not only a violation of ethics but also a potential menace in that self-medication will be encouraged. The purpose of such designations resides in the need to assist the physician in telephone checkups when the records are not immediately available to him, I personally feel that labeling of prescriptions, when feasible, is of great assistance to the physician as a means of follow-up.

Ralph Spaeth, M. D.
9030 S. Bell Ave.
Chicago 20.

From: *J. Am. Med. Assoc.* 166:1639 (Mar. 29) 1958.

MEETING DATES 1958

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May

National Hospital Week—May 11-17

Southeastern Hospital Conference
Includes Meeting of Southeastern Society of Hospital Pharmacists—May 14-16, Miami Beach, Fla. Hotel Fountainbleau

June

Institute on Hospital Pharmacy (A.H.A.)
June 16-20, Philadelphia, Pa. Temple University Campus

Catholic Hospital Association
Annual Convention—June 21-26, Atlantic City, N. J. Convention Hall; Dennis Hotel

Institute for Hospital Pharmacists (C.H.A.)
June 21-24, Atlantic City, N.J.

July

Philadelphia College of Pharmacy and Science Summer Courses
July 7-August 1, Philadelphia, Pa.

Preparation of Parenteral Products
July 7-18, Fifth Annual Radiochemical Institute

Principles of Radioactivity and Measurement
July 7-18

Biological and Medical Application
July 21-25

Radiochemical Instrumentation
July 28-August 1

Institute on Hospital Pharmacy (A.H.A.)
Chicago—July 28-August 1. University of Chicago

August

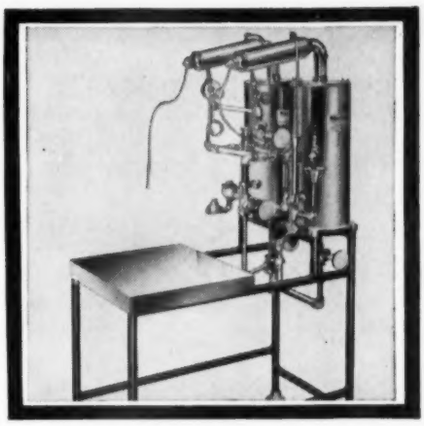
American Hospital Association —
Annual Convention—August 18-21, Chicago, Ill. International Amphitheatre; Palmer House

September

International Pharmaceutical Federation
September 8-13, Brussels, Belgium

December

American Association for the Advancement of Science
December, Washington, D.C.



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POSITIONS

in hospital pharmacy

PERSONNEL PLACEMENT SERVICE

The Personnel Placement Service is operated without charge for the benefit of hospitals and pharmacist members of the American Pharmaceutical Association and the AMERICAN SOCIETY OF HOSPITAL PHARMACISTS. The ultimate purpose is the improvement of pharmaceutical services in hospitals, by more adequately fulfilling hospital pharmacy personnel needs and by locating positions which provide challenging opportunities for pharmacists who have indicated an interest in a hospital career.

By participating in the service, the hospital indicates a desire to achieve a pharmaceutical service which meets the *Minimum Standard for Pharmacies in Hospitals.* A description of the position should be submitted to the Division of Hospital Pharmacy on the forms provided. The hospital will receive applications directly from the applicant. The hospital agrees to reply to each application received and to notify the Division of Hospital Pharmacy when the position is filled.

The pharmacist, by participating, agrees to submit a Personnel Placement Service Information Form to the Division of Hospital Pharmacy. The applicant will then be notified of openings listed with the Service as they become available and can negotiate directly with the hospital if he is interested. It is agreed that the Division of Hospital Pharmacy will be notified as soon as a position is accepted.

A listing of positions open and wanted will be made regularly in the AMERICAN JOURNAL OF HOSPITAL PHARMACY without charge. Neither the name of the hospital offering the position nor the name of the applicant will be listed, except by code. All inquiries should be directed as shown above, including the code number.

Address all inquiries to

Division of Hospital Pharmacy
2215 Constitution Avenue, N. W.
Washington, 7, D. C.

positions wanted

CHIEF PHARMACIST—prefer small general hospital, but will consider larger hospital; prefer Michigan, but will consider remainder of Midwest. Two years' experience in hospital pharmacy. PW-10.

PHARMACIST—female; experienced in both hospital and retail pharmacy. Prefer Southwest or Mid-Atlantic area. PW-11.

CHIEF PHARMACIST—prefer general hospital in Florida; registered in Ohio and Florida; experienced in both hospital and retail pharmacy. PW-12.

CHIEF PHARMACIST—or assistant chief pharmacist at large hospital; prefer St. Louis vicinity; presently employed as staff pharmacist in hospital; registered in Missouri. PW-13.

CHIEF PHARMACIST—prefer Minnesota or California, with registration in those states; ten years' experience with government service, including commissions in U. S. Public Health Service and in the Navy; experience with the Veterans' Administration as Chief Pharmacist; Pharm. D. degree. PW-15.

PHARMACIST—New Jersey registration; prefer Pennsylvania, Florida, D. C., or Virginia; experienced in managing retail pharmacy. PW-18.

CHIEF PHARMACIST—or chief pharmacist—purchasing agent; prefer non-sectarian and non-governmental institution of 200-bed capacity or larger; experienced in managing retail and hospital pharmacy. PW-19.

CHIEF PHARMACIST—prefer teaching hospital—registered in Indiana, Michigan and Missouri; prefer general hospital in Midwest; experienced in teaching and in hospital pharmacy. PW-26.

PHARMACIST—registered in Ohio since 1934; experience in retail pharmacy only (23 years); PW-27.

STAFF PHARMACIST—prefer Chicago vicinity; registered in Illinois; graduate of the University of Illinois, College of Pharmacy. PW-31.

CHIEF PHARMACIST—or assistant chief pharmacist in medium size hospital; registered in Indiana, Michigan and Wisconsin; six years' experience as chief pharmacist; experienced as pharmacist-purchasing agent; two years as such; prefer Midwest or East. PW-32.

STAFF PHARMACIST—graduate, Masssachusetts College of Pharmacy; age 27; registered in Massachusetts and New Hampshire; four years' experience before registration and four years in store with large prescription volume. PW-35.

CHIEF PHARMACIST—or assistant chief pharmacist; M. S. in hospital pharmacy; internship; available immediately. PW-36.

PHARMACIST IN LARGE TEACHING HOSPITAL OR ADMINISTRATOR—Registered in Ohio; experience in retail pharmacy, hospital administration and X-ray. For further information, please write PW-37.

PHARMACIST—male, married, B.S. Four years retail experience; 2 in Army Dispensary. Registered N.Y. Desires to locate in East. PW-44.

PHARMACIST—graduate of Medical College of Virginia; age 26; served two years in Marine Corps; managerial experience. PW-45.

HOSPITAL PHARMACY INTERN—graduate of the University of Washington College of Pharmacy; age 25; completed military requirements; prefer Northwest. PW-46.

PHARMACIST—graduate of Wayne University College of Pharmacy; hospital experience; prefer D. C. area. PW-49.

STAFF PHARMACIST—or assistant chief pharmacist; graduate George Washington University College of Pharmacy; prefer D. C. or Florida area; registered in D. C. PW-52.

CHIEF PHARMACIST—300 plus bed hospital preferred; completed hospital pharmacy internship at Jefferson Medical College hospital; registered in Pennsylvania and Texas; age 25; male; completed service requirements. PW-55.

CHIEF PHARMACIST—prefer middle West; registered in Illinois; female, single; graduate of University of Illinois College of Pharmacy; presently employed as Chief Pharmacist. PW-61.

CHIEF PHARMACIST—M. S. Degree in hospital pharmacy; prefer East; male, single; extensive experience, including pharmacy and administrative officer in Air Force. PW-62.

STAFF PHARMACIST—completed military requirements; experienced in hospital pharmacy; prefer mid-Atlantic area; single, male. PW-63.

CHIEF PHARMACIST—registered in Tennessee, Louisiana and Texas; prefer South; graduate of University of Tennessee School of Pharmacy; also attended Louisiana State University. PW-64.

PHARMACIST—desires position Baltimore area; prefer small hospital; experience includes 21 years as owner-manager of retail store. PW-65.

STAFF PHARMACIST—registered in Pennsylvania; graduate of Duquesne University; prefer location in large city but in any section of the country; single, female; PW-67.

INDIAN PHARMACIST—desires appointment to obtain higher training in hospital pharmacy; graduate Madras University; 1½ years' experience in 1,000 bed hospital, including inpatient and outpatient dispensing, parenteral and general manufacturing, and administration; available September, 1958. PW-68.

CHIEF PHARMACIST—M. S. degree in hospital pharmacy; served residency at V A Center in Los Angeles; 3 years' experience as chief pharmacist in V. A. since that time; registered in Kentucky and Florida; prefer Midwest location. PW-69.

CHIEF PHARMACIST—Administrator—registered in Alabama and Virginia; prefer Southeast or the South; education includes administration as well as pharmaceutical; PW-70.

CHIEF PHARMACIST—prefer New York state; graduate of Albany College of Pharmacy; registered in New York and Vermont. Write PW-71.

STAFF PHARMACIST—graduate of Butler University; internship at Freedman's Hospital in Washington, D. C.; experienced in hospital pharmacy, including duty as Chief Pharmacist; prefer District of Columbia area; registered in Indiana, D. C. and North Carolina; female; PW-72.

CHIEF PHARMACIST—registered in Kentucky; prefer Kentucky; graduate of U. of Kentucky; female; PW-73.

STAFF PHARMACIST—graduate of Faculte de Medecine et Pharmacie, Port au Prince, Haiti; not a U. S. citizen; prefer Northeast; PW-74.

CHIEF PHARMACIST OR ASSISTANT CHIEF PHARMACIST—prefer Pacific states; registered in California and Washington; graduate of State College of Washington. PW-76

CHIEF PHARMACIST IN SMALL HOSPITAL OR ASSISTANT CHIEF IN LARGE HOSPITAL—prefer East or Midwest; Master's Degree in Hospital Pharmacy, U. of Michigan. PW-77

DIRECTOR OF PHARMACY SERVICE—prefer East; registered in New York and Pennsylvania; intensive hospital pharmacy experience; PW-78.

ASSISTANT PHARMACIST—Male, married. 10 years hospital experience as assistant pharmacist. Registered Minnesota. Desires midwest location. PW-79.

ASSISTANT CHIEF PHARMACIST—Male, single. Registered New York, Vermont. Served hospital pharmacy internship; now employed part-time staff pharmacist. Prefers eastern part of country. PW-80.

CHIEF PHARMACIST—Male, married. Five years hospital experience; six years retail. M. S. Hospital Pharmacy. Registered Mass., Conn., and Calif. Desires northeast location. PW-81

ASSISTANT CHIEF PHARMACIST—Male, single. M.S. Pharmacy. Presently instructor in pharmacy. Background hospital and retail pharmacy. Registered Nebraska and Penna. Desires midwest location. PW-82.

PHARMACIST—(Relief) Male, single. Registered New Jersey. Hospital background and internship. Locate New Jersey. PW-83.

PHARMACIST—Self employed retail pharmacy 20 years. Ph. G. degree; registered New York. Three years hospital experience. Prefers locate New York. PW-84.

ASSISTANT CHIEF PHARMACIST—Male, married. Three years USAF hospital experience. Served internship. Candidate M.S. August '58. Registered Iowa. Prefers Iowa and west. PW-85, A.

CHIEF PHARMACIST—Sixteen years hospital pharmacy, presently employed Chief Pharmacist. Female, single. Registered Michigan and Illinois. Prefers locate mid-west. PW-85.

CHIEF PHARMACIST—Male, single. M.S. Hospital Pharmacy. Presently employed as instructor. Registered Tennessee. Hospital pharmacy experience. PW-86.

STAFF PHARMACIST—female, married, with B.S.; 4 years hospital experience; registered in and prefers Washington State. PW-87.

IRANIAN PHARMACIST—Desires opportunity to continue hospital pharmacy studies; single, age 30; excellent academic background; now studying industrial chemistry. Prefers location in the West or Northwest. PW-88.

ASST. CHIEF PHARMACIST—female, single, B.S. 1 year hospital pharmacy internship. Registered Okla. Prefers west or southwest. PW-89.

STAFF PHARMACIST—Female, married; registered La., Tex. and N. Y. Two years hospital experience. Desires to locate Northeast or Southeast. PW-90.

positions open

STAFF PHARMACIST—registered in Illinois; for manufacturing or dispensing in large teaching hospital; excellent equipment; good hours; two weeks' vacation; sick leave; minimum starting salary, $470.00 per month; higher salary for those experienced in manufacturing. PO-1.

ASST. CHIEF PHARMACIST—55 bed general hospital. Assume supervision of five pharmacists and two porters. Must have N. Y. registration. At least 5 years experience in hospital pharmacy. 35 hour week, 2 weeks vacation; other benefits. Salary $4500-$5000. PO-5.

CHIEF PHARMACIST—eligible for licensure in New Jersey; 350-bed hospital. PO-6.

PHARMACIST—80 bed hospital; full responsibility for pharmacy and central sterile supply services; minimum of one year experience in hospital pharmacy; salary open. PO-17.

ASSISTANT CHIEF PHARMACIST—209 bed general hospital, expanding to 300 beds; 40-hour week; three weeks' vacation; $5,000.00 annually; New Jersey registration required. PO-18.

PHARMACIST—162 bed hospital located in Ohio; assume complete charge of the department; prefer woman with hospital pharmacy internship; salary open. PO-21.

ASSISTANT CHIEF PHARMACIST—185 bed hospital prefer member of Seventh Day Adventist Church. PO-22.

STAFF PHARMACIST—eligible for licensure in Connecticut; 279 bed hospital; new, modern general hospital located on Long Island Sound, 28 miles from New York City; excellent working conditions and personnel policies. PO-23.

CHIEF PHARMACIST—Kentucky registration required; salary, $6420; 40-hour week; 4 week vacation; non-contributory retirement plan; guaranteed annual salary increases. PO-26.

STAFF PHARMACIST—female preferred; 274 bed hospital and 172 bed maternity hospital; California registration required; salary, $525.00 per month; benefit program represents 17 percent of base salary. PO-27.

CHIEF PHARMACIST—private hospital in South Carolina; to be in complete charge of pharmacy, including purchase and control of drugs; work with medical staff; salary $400.00 to start; retirement program; 41 hour week, 2 week vacation. PO-28.

ASSISTANT CHIEF PHARMACIST—315 bed community hospital located in New York state; female preferred; 40 hour week; three weeks' vacation; salary open. PO-31.

ASSISTANT CHIEF PHARMACIST—181 bed general hospital; California registration required; 40 hour week; two weeks' vacation; salary $450 to $500 per month. PO-32.

STAFF PHARMACIST—550 bed general hospital located in Ohio; registration required; 40 hour week; two weeks' vacation; salary $2.50 per hour or based on experience. PO-34.

STAFF PHARMACIST—259 bed general hospital; Virginia registration required; hospital pharmacy experience preferred; 40 hour week, 2 weeks' vacation; salary open. PO-35.

STAFF PHARMACIST—750 bed general hospital located in New York state; B. S. degree required; hospital pharmacy experience desirable but not necessary; 40 hour week; two weeks' vacation; $415.00 per month. PO-36.

STAFF PHARMACIST—manufacturing, dispensing, inventory control and some supervision; registration in Tennessee required; salary $385.00 to $400.00 per month; 44-hour week; paid sick leave. PO 37.

STAFF PHARMACIST—prefer one or more years' experience, with at least one year internship; 42-hour week; 4 week-vacation; salary $450.00 month plus one meal; 660 bed teaching hospital. PO-38.

ASSISTANT CHIEF PHARMACIST—200 bed general hospital located in Tennessee; excellent opportunity for advancement; generous benefits; salary open. PO-39.

STAFF PHARMACIST—sterile and non-sterile manufacturing; outpatient and in-patient dispensing; retirement benefits; located in New England; PO-40.

STAFF PHARMACIST—Ohio license required; experience not especially necessary; some manufacturing of sterile solutions, etc. prescription filling; $100.00 to $110.00 per week; 40-hour week; PO-41

STAFF PHARMACIST—dispensing and manufacturing; preparation and compounding of N.F. and U.S.P.; Salary $4680 to $5500.00; 44 hour week; 2-week vacation. Social Security and Retirement; hospitalization; located in New York State; New York registration required. PO-42.

CHIEF PHARMACIST—120 bed general, non-profit hospital. Individual will have complete charge of ordering, dispensing and charging of medical supplies; also assist in general hospital purchasing. Either male or female; registration in Ohio required; experience in retail pharmacy given preference. Salary open; 40-48 hours per week; 2 weeks vacation; other general hospital benefits. PO-44.

ASSISTANT CHIEF PHARMACIST—150 bed general hospital located in midwest; 100 bed addition with out-patient service anticipated. Prescription filling and supervision of pharmacy aide; limited manufacture of nonsterile solutions. Registration preferred. Salary open; 40-48 hour week; sick leave and holidays with pay. PO-45.

CHIEF PHARMACIST—325 bed general hospital located in Pennsylvania. Sufficient background and experience to operate department in accordance with Minimum Standard and some small-scale manufacturing required. 4 weeks vacation; 40 hour week; other hospital employment benefits. Salary $5500. PO-46.

ASSISTANT CHIEF PHARMACIST—For hospital described in PO-46. Must be capable of assuming complete responsibility in absence of Chief Pharmacist. Same benefits. Salary $4500. PO-47.

STAFF PHARMACIST—487 bed general hospital. Inpatient and outpatient prescriptions; manufacture of some injectibles. Male or female. Will take recent hospital internship graduate with high academic achievement. 40 hour week, 2 weeks vacation and other benefits. PO-48.

STAFF PHARMACIST—480 general hospital; must be (or eligible) registered in Ohio. Varied duties including stock control, purchasing, assisting in instructing student nurses in pharmacology. 40 hour week, 2 weeks vacation, other benefits. PO-49.

STAFF PHARMACIST—300 bed general hospital. Inpatient orders, no bulk compounding. Must be eligible for Ill. registration. 44 hour week, 2 weeks vacation. PO-50.

STAFF PHARMACIST—450 bed general hospital. B.S. in pharmacy. 1 year hospital pharmacy internship or one year's experience professional pharmacy; Colorado licensure. 40-hour week, vacation - other benefits. Salary $383. PO-52.

CHIEF PHARMACIST—200 bed general hospital. Take complete charge of pharmacy; must be eligible registration in New Mexico. 44-hour week, two weeks' vacation, other benefits. Salary $475-$500. PO-53.

CHIEF PHARMACIST—325 bed private hospital. Position includes compounding, dispensing, manufacturing all types of pharmaceuticals. Must be eligible for registration in North Carolina. Male or female; hospital experience desirable, but not necessary. About 45-hour week, 3 weeks' vacation, other benefits. Salary $450-$500. PO-54.

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